

**THE RELATIONSHIP BETWEEN POVERTY AND HIV/AIDS
IN SUDAN**

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Abstract

This thesis investigates the complex and vicious circle of poverty and Human Immune Virus (HIV)/Acquired Immune Deficiency Syndromes (AIDS) in Sudan. The study focuses on selected dimensions of poverty that increase the risk and vulnerability to HIV/AIDS, which is pertinent as poverty can hamper mitigating efforts. The study adopted the livelihood, drive and structuration theories approach as the theoretical framework, to investigate the relationship between poverty and HIV/AIDS in Sudan.

The study was conducted using a mixed method approach. Quantitative data from people living with HIV/AIDS was compiled using survey questionnaires while qualitative data gathered from Focus Group Discussions. The study also deployed data from the 2010 Sudan Household Health Survey. Data was analysed using structural equation modelling, discriminant analysis and Scissor-and-sort. In addition, T-tests and chi-square tests were carried out to strengthen the descriptive findings. The findings brought out evidence that poverty and related factors were significant contributors to exposing the people in Sudan to HIV-risks. Furthermore, HIV epidemic forces people living with HIV/AIDS to utilise their savings for healthcare expenses, which then pushes them to borrow and sell their assets. The empirical evidence amassed also showed significant variations in coping strategies between men and women, with the latter being more vulnerable than the former to the impact of the disease, which is due to women's low income, low level of education and hence their low ability to pay for children's schooling and health care expenses.

In addition, the results demonstrated that low education; low economic status and gender inequality significantly affects HIV- risk among poor men, while significantly increasing the risk of HIV infection among women in all segments of society. These variables coupled with social, cultural and traditional factors, place women in Sudan at a disadvantage. Hence, the study suggests that, women are more

vulnerable than men to HIV due to poverty as well as social, cultural and structural factors.

The results offer compelling evidence for the formulation of comprehensive approaches to HIV prevention that cut across all socio-economic strata of the community. In addition, there is need to target the drivers of transmission in specific groups, mainly most at risk populations. Thus, the key message to health care policy-makers is to extend efforts to strengthen prevention and treatment interventions without ignoring the vulnerability and its associated socio-economic factors. This study offers several contributions. Firstly, it provided qualitative and quantitative empirical evidence to establish the causal relationships between poverty and HIV/AIDS in Sudan. The results help fill a lacuna in understanding HIV/AIDS problems in Sudan specifically, and the developing countries generally, which can be used by policy-makers to formulate effective preventive strategies at the national and local levels.

Secondly, the survey findings by gender provided important information about the variation in socio-economic background, and demographic variables and assessed the risk behaviours that exist between men and women in the context of vulnerability to HIV infection and coping strategies among infected people in Sudan. This information can be utilised to formulate effective preventive strategies that take account of socio-economic background of vulnerable groups

Thirdly, the study used different data sets and a sound conceptual framework to generate a comprehensive set of conclusions establishing the link between socio-economic background and HIV/AIDS risks. Fourthly, and most interestingly, the study proposed a model, which can be deployed as a promising tool to identify the socio-economic factors that are likely to cause HIV-risk. Fifthly, the study provides significant empirical evidence of the importance of education in reducing the spread of

HIV by avoiding HIV risk through using condoms, adherence to one non-infected partner, avoiding sexual contact with irregular partners and high-risk populations.

Finally, the study identified the impact of HIV/AIDS in Sudan, the results of which are hoped to be useful for researchers interested in strengthening their understanding of HIV/AIDS as not just a health problem but also a development problem.

Abstrak

Tesis ini bertujuan untuk mengkaji hubungkait yang wujud daripada masalah kemiskinan dan penyakit HIV / AIDS di Sudan. Tumpuan diberikan kepada beberapa dimensi yang mendorong kepada peningkatan risiko dan pendedahan kepada HIV / AIDS yang akan menyebabkan tahap agregat kemiskinan bertambah teruk pada masa hadapan. Kajian ini menggunakan ‘teori livelihood, drive and structuration’ sebagai pendekatan untuk menggambarkan rangka kerja teori yang bertujuan untuk mengkaji hubungan antara kemiskinan dan penyakit HIV/AIDS di Sudan.

Kajian ini dijalankan dengan menggunakan kaedah pendekatan penyelidikan ‘mixed-method’; analisis kuantitatif dijalankan melalui temubual berdasarkan kaji-selidik dan analisis kualitatif dijalankan kepada kumpulan fokus (FGDs) melalui perbincangan. Kajian ini juga menggunakan data dari ‘Sudan Household Health Survey 2010’.

Kajian membuktikan bahawa kemiskinan dan faktor-faktor yang berkaitan dengannya telah menjadi penyumbang penting kepada risiko HIV di Sudan. Pengidap HIV/ AIDS (PLHIV) terpaksa menggunakan simpanan mereka untuk membiayai kos perubatan dan juga mendorong mereka untuk membuat pinjaman serta menjual aset yang sedia ada. Kajian menunjukkan bukti bahawa terdapat perbezaan di antara lelaki dan wanita di dalam mengatasi kesan daripada penyakit tersebut dan wanita adalah lebih terbuka untuk menerima kesannya.

Hasil penyelidikan menunjukkan bahawa taraf pendidikan yang rendah, status ekonomi dan ketidaksamaan gender memberi kesan yang signifikan kepada risiko jangkitan HIV di kalangan kaum lelaki. Peningkatan risiko ini adalah ketara di kalangan golongan miskin jika dibandingkan dengan golongan kaya kerana status ekonomi mereka yang rendah serta kurangnya pengetahuan mengenai cara pencegahan jangkitan HIV dan juga faktor kelemahan wanita. Jika dibandingkan, golongan wanita

mengalami banyak kekurangan dari segi sosial dan ekonomi berbanding lelaki. Oleh itu, kajian ini menyarankan bahawa wanita lebih mudah dijangkiti HIV bukan sahaja atas faktor kemiskinan tetapi turut dipengaruhi oleh kombinasi faktor sosial, budaya dan struktur.

Hasil daripada kajian ini mendapati bahawa pendekatan untuk pencegahan HIV perlu meliputi setiap strata sosio-ekonomi masyarakat dan perhatian perlu diberikan kepada setiap golongan masyarakat, terutamanya kepada populasi yang berisiko untuk mengidap penyakit ini. Oleh itu, kajian ini menyarankan kepada penggubal polisi di Sudan agar lebih memberi tumpuan untuk mengatasi dan mencegah penyakit ini tanpa mengabaikan faktor sosio ekonomi. Kajian ini mempunyai beberapa sumbangan. Pertama, kajian ini memberikan analisis kualitatif dan juga kuantitatif untuk mengisi ruang informasi berkaitan hubungan antara kemiskinan dan HIV/AIDS di Sudan, dimana ia mencipta jurang di dalam pelaksanaan dasar kerajaan di antara peringkat kebangsaan dan daerah.

Kedua, hasil kaji selidik ini dapat mengkategorikan responden berdasarkan jantina dan menentukan perbezaan dari segi sosio-ekonomi dan demografi; dan juga mengukur perbezaan tingkah laku di antara kaum lelaki dan wanita dan juga strategi untuk menangani penyakit di kalangan penghidap HIV. Maklumat ini boleh menyumbang kepada peningkatan kualiti maklumat sosio-ekonomi serta membangunkan strategi untuk mengurangkan kadar kemiskinan. Ketiga, kajian ini menggunakan data set yang berbeza dan cubaan untuk hubungkan analisis dengan kerangka konsep untuk menghasilkan rumusan yang komprehensif untuk subjek yang kompleks ini. Keempat, dan yang paling menarik adalah kajian ini mencadangkan model untuk menjadi alat yang dapat mengenalpasti faktor sosio-ekonomi dan hubungkait dengan tingkah laku mendorong kepada jangkitan HIV. Sumbangan yang terakhir adalah untuk mengenalpasti kesan HIV/AIDS ke atas pembangunan di Sudan, di mana ianya diharap

dapat memberi sumbangan kepada penyelidikan baru kerana HIV/AIDS ini bukan sahaja melibatkan masalah kesihatan tetapi juga menjejaskan pembangunan.

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LIST OF ABBREVIATIONS

ACORD	Association for Cooperative Operation Research and Development
AIDS	Acquired Immune-Deficiency Syndrome
AMOS	Analysis of the Moment Software
ART	Anti-Retroviral Treatment
AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CPA	Comprehensive Peace Agreement
DA	Discriminant function Analysis
EMRO	Regional Office for Eastern Mediterranean
FDIs	Foreign Direct Investments
FGDs	Focus Group Discussions
FGM	Female Genital Mutilation
FMOH	Federal Ministry of Health
FSWs	Female Sex Workers
GDP	Gross Domestic Product
GNU	Government of National Unity
GOSS	Government of South Sudan
HIV	Human Immune-Deficiency Virus
IBBS	Integrated Bio Behavioural Survey
IDPs	Internal Displaced Persons
IDUs	Injections Drug Users
IFAD	International Fund for Agricultural Development
ILO	International labour Organisation
IMF	International Monetary fund
JICA	Japan International Cooperation Agency
KAPS	Knowledge, Attitude, Behaviours Survey
LDCs	Less Development Countries
MARPs	Most At Risk Populations

MDGs	Millennium Development Goals
MENA	Middle East and North Africa
MICS	Multiple Indicator Cluster Survey
MSM	Men having Sex with Men
NAC	National AIDS Council
NASA	National AIDS Spending Assessment
NGOs	Non-Governmental Organisations
NSP	National Strategic Plan
PAPFAM	Pan Arab Project for Family Health
PLHIV	People Living with HIV
PMTCT	Prevention of Mother to Child Transmission
RMSEA	Root Mean Square Error of Approximation
SDGs	Sudanese Pounds
SEM	Structural Equation Modelling
SHHS	Sudan Health Household Survey
SNAP	Sudan National AIDS Control Programme
SPSS	Software Package used for Statistical Science Analysis
STIs	Sexual Transmission Infections
TB	Tuberculosis
TB/HIV	Tuberculosis and Human Immune-Deficiency Virus (Co- Infection)
UNAIDS	United Nations Joint Programme on AIDS
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNGASS	United Nations General Assembling Special Session
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Childhood and Education Fund
USAID	US Agency for International Development
VCT	Voluntary Counselling and Testing
WFFC	World Fit For Children
WFP	World Food Programme
WHO	World Health Organisation

LIST OF APPENDICES

Appendix A. PLHIV Survey Questionnaire

Appendix B. Ethical Consideration Letter

Appendix C. Output from the household Survey (Qui Squire Analysis)

Appendix D. Output from the household Survey (SEM Analysis)

Appendix E. The Focus Group Discussions design and questionnaire

Appendix F. The Focus Group Discussion among PLHIV

CHAPTER 1

Introduction

1.1 Introduction

Disease epidemics are like wars, natural disasters and starvations by perpetually challenging development efforts. World over, the HIV/AIDS epidemic has been cause for the starvation of millions of children with an estimated 16 million children orphaned by AIDS by 2012 and 70-90 million living with HIV/AIDS infected parents (Cluver et al., 2013). The HIV/AIDS epidemic devastates the health, destroys livelihoods, and leads to economic ruin.

HIV/AIDS is not only a major health crisis but also a development issue. In responding to it, it is vital to understand the socio-economic impact of this epidemic beyond the loss of financial resources. These include the diversion of finance to health expenses and resorting to maladaptive coping mechanisms with negative long-term effects by families, including child labour, disposing of assets and depletion of savings (Mbirimtengerenji, 2007). Households with infected members face crises caused by illness and/or death among their family members, suffering from the direct catastrophic expenses of healthcare, funeral costs and the indirect outlays of the adverse impact of sickness on productivity (Whiteside, 2002).

Previous studies have shown a clear association between poverty and health status (Greener & Sarkar, 2010; WHO, 2008; Alsan et al., 2011). HIV/AIDS is an outcome of worsened conditions of poverty, worsening nutrition, and increasing treatment and healthcare expenses (Stillwagon, 2000). It is associated with shame, stigma, discrimination, and is shaped by fear and death. The disease challenges our values and cultural norms (Mbonu et al., 2009).

As of 2012, more than 35.3 million people over the world are living with HIV, of whom half are women and 2 million are children. There were 2.3 million new HIV

infections globally showing a 33 percent decline in the number of new infections from 3.4 million in 2001, as more people are receiving the ART drugs. The epidemic is most severe in Africa (Whiteside, 2001; UNAIDS, 2012).

Since the beginning of the epidemic, HIV has affected the most vulnerable segments of society. It typically strikes the most productive and vulnerable segment of the population and the consequences of the epidemic on the economic growth of the affected regions are extensive at both the micro and macro levels (Collins & Rau, 2000; Lim & Dwyer, 2001). The result is increasing dependency ratios in several countries. For instance, there are decreases in productive adults on whom both children and elderly rely, a situation that is becoming very severe (Foster & Williamson, 2000).

Sudan is categorised as a low-income country with low HIV prevalence compared to many other African countries (Lake & Wood, 2005; World Bank, 2003). From a comprehensive epidemiological and behavioural assessment of the HIV and AIDS situation in Sudan, the total HIV prevalence is estimated at 0.24 percent (UNAIDS, 2014). The significance of an impact assessment in a country with an HIV prevalence rate of less than 5 percent is explained by the need to inform the public of the importance of having both effective prevention programmes and targeted care/support strategies.

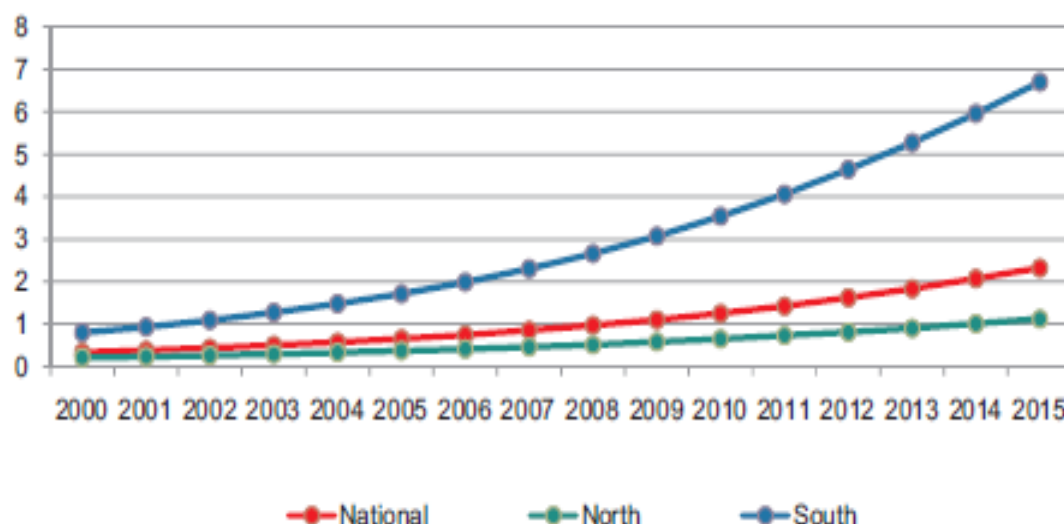
The Sudan National AIDS Control Programme (SNAP) reported that the most affected states are those torn by war such as Western states and the Blue Nile state (SNAP, 2010). The estimated HIV prevalence rate among adults in the Republic of South Sudan was approximately 3 percent in 2009, while in Khartoum (the Capital of Sudan) there was a higher prevalence rate. The eastern states of Kassala and Gedarif show prevalence rates of 4.4 percent among refugees who are mainly Ethiopians and Eritreans (SNAP, 2010).

The most infected population in Sudan are aged between 16 to 49 years. (Khamis, 2013). The first case of AIDS in Sudan was reported in 1986, followed by an additional two cases in 1987 and a small annual increase to 250 cases by the end of 1997. This number quickly increased to 511 cases by 1998 and 652 cases by 2000. In total, 5,214 cases were reported in the period between 1986 to the third quarter of 2003. From 2004 up to the fourth quarter of 2011, 10754 cases were reported, and the total number of HIV cases since the emergence of the first case of HIV was calculated at 11484 (SNAP, 2011) (see Table 1.1 and Figure 1.1).

Table 1.1: Number of HIV/AIDS Cases in Sudan by Years

HIV/AIDS Cases	HIV		AIDS	
Year	Number of cases	Percentage	Number of cases	Percentage
Up to 1988	977	8.5%	2343	21.9%
1990	578	0.5%	517	4.8%
2000	598	05.2%	652	6%
2001	554	4.8%	678	6.3%
2002	1992	17.3%	630	5.9%
2003	916	0.8%	524	4.9%
2004	249	2.2%	543	5%
2005	470	4.1%	483	4.5%
2006	1069	9.3%	418	3.9%
2007	1422	12.4 %	887	8.2%
2008	597	5.2%	1343	12.5%
2009	513	4.5%	708	6.6%
2010	865	7.5%	680	6.3%
2011	684	6%	348	3.2%
Total	11484	100%	10754	100%

Source: Sudan National AIDS Control Programme Surveillance Annual Report 2012



Source: Sudan National AIDS Control Programme (2012)

Figure 1.1: HIV Epidemic Projections in Sudan, 2000-2015

The number of reported cases does not reflect the real situation of the HIV/AIDS epidemic. A large gap exists between these figures compared to estimates from UNAIDS of 304,945 (UNAIDS, 2011) (see Table 1.2). Many factors limit the flow of information to the central monitoring system mainly due to weaknesses in the reporting system, stigma and poor health facilities in terms of infrastructure and human resources at the State level (SNAP, 2010).

1.2: Sudan HIV Estimates 2010

Estimates	Percent and Numbers
HIV prevalence (15-49 years)	1.25%
North	0.65%
South	3.54%
Number of new infections	59.182
North	24.144
South	35.038
AIDS Death	13.059
North	5.328
South	7.731
Number of people livings with HIV/AIDS	304.945
North	124.405
South	180.540

Source: UNAIDS Estimates 2009-2010

Sudan is located in the Saharan desert, resulting in harsh climatic conditions. A lack of natural resources coupled with these harsh climatic conditions have been partially responsible for deprived living conditions. The country's political uncertainty and internal clashes have further aggravated the level of poverty and deprivation with the incidence of poverty at 46.5 percent (UNDP, 2013). The poverty gap and the poverty harshness index stood at 16.2 percent and 7.8 percent respectively in 2012 indicating severe poverty in Sudan (UNDP, 2013). The manifestation of poverty among the population in Sudan ranges from approximately a quarter of the population in Khartoum State to more than two-thirds of the entire population in North-West Darfur.

The Human Development Index of Sudan is low and scored 0.408 in 2011, ranking at 169 out of 179 countries compared to 0.403 and 0.406 in 2009 and 2010, respectively (UNDP, 2011). According to a 2007 World Bank-UNDP joint mission in Sudan, approximately 60-75 percent of the population are estimated to be living below the poverty line of less than US\$ 1 per day.

The International Monetary Fund - IMF (2013) reported that many socio-economic and cultural factors have further worsened the poverty status in Sudan. These include religious and cultural persecution, political instability and low percentage of

school enrolment. The net secondary school enrolment rate for the 14 to 16 year old population stands at only 22 percent. The net secondary enrolment rate for the urban population is 37 percent compared to the rural population rate of 14 percent (UNDP, 2012). In 2011, literacy among the urban population reached 79 percent compared to 51 percent in the rural population. The literacy gender gap ratio for the population of 15 years old and above is 0.71 with 73 percent of the male population being literate compared to 52 percent of the females (UNDP, 2012).

Approximately 44.8 percent of the total population of Sudan are consuming food below the poverty line of 69 SDG (Sudanese Pound) per month (equivalent to 20 USD). The food insecurity index is higher within rural areas (55%) compared to 28 percent in urban areas. Moreover, inadequate healthcare services coupled with a sense of powerlessness of women in a patriarchal society aggravates their poor livelihood. In addition, established negative cultural/traditional practices such as female genital mutilation (FGM), polygamy, levirate marriage and widow inheritance, also increased deprivation (UNICEF and SNAP, 2005). Therefore, this study investigates whether such impoverished conditions contribute to greater HIV exposure in Sudan.

1.2 Background:

1.2.1 Sudan Background

Before the separation of South Sudan in 2011, Sudan had a total population estimated at approximately 39 million inhabitants (North: 30,894,000 or 78.9 percent) South: 8,260,490 or 21.1 percent) (Sudan Population Census, 2008). After the separation of North and South Sudan, the North became known as the Republic of Sudan, while the South is now the Republic of South Sudan. It is important to point out that this study was carried out in the Republic of Sudan after the separation in September 2011. Sudan is neighboured by Egypt to the North, the Red Sea to the

Sudan is a vast and diverse country with complex cultural, religious and linguistic groups and identities (Lake & Wood, 2005). Coexistence of these various ethnic groups means frequent contact socially and culturally. It is estimated that about 50 percent of the people of Sudan are of Arab descent and make up the country's largest ethnic group. Some are descended from Arab immigrants whereas others belong to the Sudanese groups that progressively adopted the Arab way of life, language and culture. Most Arabs live in the north of the country. Other ethnic groups living in this region include the Nubians, Beja, Fur, and descendants of West African immigrants. Various black African groups live in the Republic of South Sudan (UNDP, 2002).

People in Sudan speak approximately 100 different languages with 50 percent of the people speaking Arabic. Arabic is the official language in the Republic of Sudan with English as the second official language. On the other hand, people in the Republic of South Sudan speak Dinka and other African indigenous languages besides English as the official language of trade and government (Kenneth, 2005).

Sudan has witnessed one of Africa's longest conflicts since its independence in 1956. The country has been involved in two long extensive civil wars during most of the latter part of the 20th century (Lake & Wood, 2005). The first civil war ended in 1972 but broke out again in 1983. The second civil war combined with the effects of famine resulted in the spread of poverty, regional inequities and disparities and, most importantly, competition for limited natural resources. The aftermath of the wars is that more than four million people were displaced from their homes and more than two million deaths within a period of two decades (Saeed & Ahmed, 2003). In Darfur (West of Sudan), a separate clash broke out in 2003 displacing approximately two million people and over 200,000 deaths (Martin et al., 2006). Recent conflicts broke out in 2011 displacing about 200,000 persons in South Kordofan and 66,000 in the Blue Nile (Ottaway & Sadany, 2012).

The official signing of the Comprehensive Peace Agreement (CPA) in January 2005 ended more than 20 years of rivalries between the North and South of Sudan. The CPA supported the establishment of the Government of National Unity (GNU) and the Government of South Sudan (GOSS) to embark on a confederation system of governance under the 'one country, two systems' (Ottaway & Sadany, 2012). The vision of the CPA was based on wealth and power sharing that attempted to ensure equity, guarantees political, human rights and civil liberties. It also aimed at preventing political and economic monopoly, and afforded a fully developed system of governance in which all Sudanese are equal (Breidlid, 2010). Few years after the signing of the CPA, the country is gradually recovering from dealing with conflict to pursuing prospective development (African Development Bank, 2009).

1.2.1.1. Economy of Sudan

Political instability due to civil war, an unfavourable climate, weak goods prices, a fall in payments from overseas, and counterproductive fiscal strategies inhibited Sudan's growth. The agricultural sector employs 80 percent of the labour force. The industrial production processes mainly cultivated commodities (UNDP, 2012). Static economic performance over the past decade due to a drop in annual rainfall has kept the per capita income at low levels and a large foreign debt and massive loan charges further constrain developmental efforts in Sudan.

Sudan's economy registered an overall mixed economic growth in 2007. According to UNDP (2014), the real Gross Domestic Product (GDP) was estimated at 2.6 percent in 2011 as against 10.9 percent in 2007 and 5 percent in 2010 and then fell to 2.6 percent in 2013 (UNDP, 2014). Continuous flows of petrodollars with significant indirect effects into other sectors of the economy enabled businesses to grow in certain sectors of the economy. However, this was short lived and was affected by a drop in

investments due to the influence of national floods and lower-than-estimated agricultural output resulting in a decline in non-oil growth. The real sector performance indicated the major role that oil was playing. The Oil GDP real growth rate reached 36 percent in 2007, as against 16.5 percent in 2006, while non-oil GDP real growth rates were much lower at 7.5 percent in 2007 (UNDP, 2010).

Due to oil loss, the growth of the industrial sector fell from 22.6 percent in 2009 to 21.4 percent in 2013 while the agriculture sector showed slight reduction in growth from 33.9 to 33.7 in both years (UNDP, 2014). The contribution of the services sector to the GDP of Sudan was approximately 44.6 percent on average (African Development Bank, 2013). However, the referendum of ninth of January 2011, which necessitated the separation of the South, had sharply affected the economy as more than 80 percent of Sudan's oil fields belong to South Sudan. This reduction in oil revenues led to a major adjustment to Sudan's fiscal situation and stimulated financial modifications.

1.2.1.2. Structure and Trends of the Sudanese Economy

Western sanctions have almost severed Sudan off from receiving loans forcing them to rely on non-concessional loans (funds being provided by the donor that must be repaid over a period of time under terms which do not make it eligible as official development assistance). Sudan is potentially suitable for deliberation of debt relief under the IMF and World Bank's highly indebted, under developed countries initiative, as its debt to export of goods and services ratio reached 277.1 percent above the 150 percent threshold (World Bank, 2009). However, due to the sanctions imposed by the West coupled with increasing external debt, IMF failed to consider Sudan for debt relief.

Table 1.3: The Economic Structure of Sudan

Item	Years									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Population (Million)	27.4	28.2	29.0	29.7	30.6	31.6	32.6	33.7	35.0	36.4
GDP @ Const. Prices (Million SDG)	18866	20122.6	21662.4	22916.0	32797.8	24868.6	26482.7	26729.2	27092.7	27800.2
Agriculture Share in GDP (%)	34	33.2	31.8	35	35.7	33.9	33.9	34.1	34.1	33.7
Industry Share in GDP (%)	21.4	22	23.9	22.7	25.2	22.6	22.6	18.5	19.5	20.4
Services Share in GDP (%)	44.6	44.8	44.3	42.2	39.1	43.5	43.5	46.5	46.5	46.5
Real GDP Growth Rate (%)	5.1	5.5	9.9	10.9	6.4	4.5	5.0	2.5	1.4	2.6
Real GDP Per Capita(USD)	769.1	996.3	1253.3	1517.3	1401.8	1286.7	1533.9	1231.3	1185.3	1031.4
Nominal GDP (Million SDG)	68698.7	85707.1	98718.8	114017.5	127746.9	139386.5	160646.5	186556.3	173995	218905
Inflation Rate (%)	9.5	8.6	7.2	6.2	14.3	11.2	13.0	18.1	42.1	25.6
Nominal GDP (Million USD)	26533	35270	45493	56444	58033	54683	66879	54918	42552	37851
Exchange Rate (SDG/USD)	2.6	2.4	2.2	2.0	2.1	2.3	2.3	2.7	3.6	5.8
Unemployment Rate (%)	16.3	16.2	17.1	20.2	16.8	17.3	17.8	18.8	N/A	N/A
Total Revenue	13223	11888	15375	18136	24708.2	19166	23536	21458	22168	25211
Oil Revenue	4131	5418	7413	9924	15996.7	9392	12082	6507	4241	6000
Total Public Expend.	10852	13771	17096	20806	22440.1	23852	24162	28578	26272	30822
Capital (Development) Expenditure	2475.14	3415.56	4031.92	3705	3720.04	2826	4262	3615	3550	4187
Development Exp. as % of Total Public Exp.	22.8	24.8	23.6	18	16.5	14.6	13.6	6.8	12.2	N/A
Development Expenditure as % of GDP	3.6	4	4.1	3.3	2.7	2.2	2.7	2.5	2.0	1.9
Total Current Expenditure as % of GDP	12.1	12	13.3	15.1	16.2	16.7	12.9	17.0	13.1	12.2
Fiscal Balance/Deficit as % of GDP	2.2	2.2	1.8	2.4	-4.9	-2.4	-2.0	-4.0	-1.7	-1.6
Debt Stock (Million USD)	26,784	27,006	28,457	31,873	33,542	35,687	37805	39,800	42,047	42,921
Debt Stock as a Ratio to GDP (%)	N/A	N/A	N/A	67.1	58.1	65.3	56.5	70.3	93.3	108.5
International Reserves(Million USD)	N/A	N/A	1660	1378	1399	897	843	295	298	313

Source: United Nations Development (UNDP, 2014).

The growth of Sudan in the past was not sufficiently broad-based. Investments and services are concentrated in and around the Khartoum State and to a lesser extent in Juba, the capital of South Sudan. Although there is significant progress in agricultural activities, continued military conflicts with the Republic of South Sudan resulted in the disruption in oil production and subsequently export losses having a huge blow on the economy of Sudan in 2012 (IMF, 2013).

The minimum wage in Sudan was approximately US\$ 62 per month. Workforces in the formal economy mostly follow minimum wage guidelines. Salaries of state workers, including teachers, often go unpaid for several months (ILO, 2013). The law limits the work per week to 40 hours. The legal minimum age for admission to employment is 18 years. Child labour is prevalent and in most cases, these children are recruited as soldiers to battle in the various internal conflicts in the country. Child labour laws are generally adhered to in the formal economy but not in the large informal economy (ILO, 2010).

1.2.2: HIV/AIDS and Poverty: Status and Trends

1.2.2.1: HIV/AIDS: Status and Trends

Despite significant advances in recent years, AIDS remains a major cause of death in Africa and is responsible for one in five deaths (WHO, 2013). As most infections are a result of heterosexual intercourse, the disease affects people in the reproductive and productive age group of between 15 and 50 years and further, this group is characterised as being the most economically and socially active (Mwambete & Temu, 2011).

The advent of anti-retroviral therapies (ARTs) has resulted in tremendous improvement in the overall morbidity and mortality of those affected, by slowing down disease progression and has changed what once was a fatal disease into a chronic treatable infection (Nguyen N. & Holodniy M.,2008). The proven therapies cost is about US\$ 13,900 per person per year for the drugs in USA (WHO, 2012). In recent years, with concerted global efforts the cost of first line therapy has been reduced. It has been reported that the median cost for ART for low-income countries was US\$792 per person per year, US\$932 for lower middle countries and US\$1454 for upper-middle income countries (Galárraga et al., 2011). In Sudan, the cost of ART was US\$600 per person per year (WHO, 2005).

The HIV incidence rate is defined as the number of new HIV infections occurring in a population during a certain period, which can be used to compare the HIV incidence between periods or populations (WHO & UNAIDS, 2011). Appropriate trends in HIV incidence rates in many countries depends on behavioural change and successful preventive programmes (Green et al., 2006). Throughout the three decades since the beginning of the HIV epidemic, Sub-Saharan Africa has been the region mostly affected by the epidemic, with approximately 67 percent of the people living with HIV/AIDS are from Sub-Saharan Africa (Mbonu et al., 2009).

The HIV prevalence rate in adults ranges from 0.7 percent in Mauritania to 33.4 percent in Swaziland. Countries most affected by the disease are all in Southern Africa, where adult HIV prevalence exceeds 20 percent in Botswana (38.8%), Zimbabwe (33.7%), Swaziland (33.4%), Lesotho (31%), and, whilst in Namibia (22.5%), Zambia (21.5%), South Africa (20.1%), and Mozambique and Malawi all have adult prevalence rates between 10 to 20 percent (Gillespie et al., 2007; Oni, 2005). Approximately 6,000 Africans die from AIDS-related diseases every day, and an additional 11,000 are

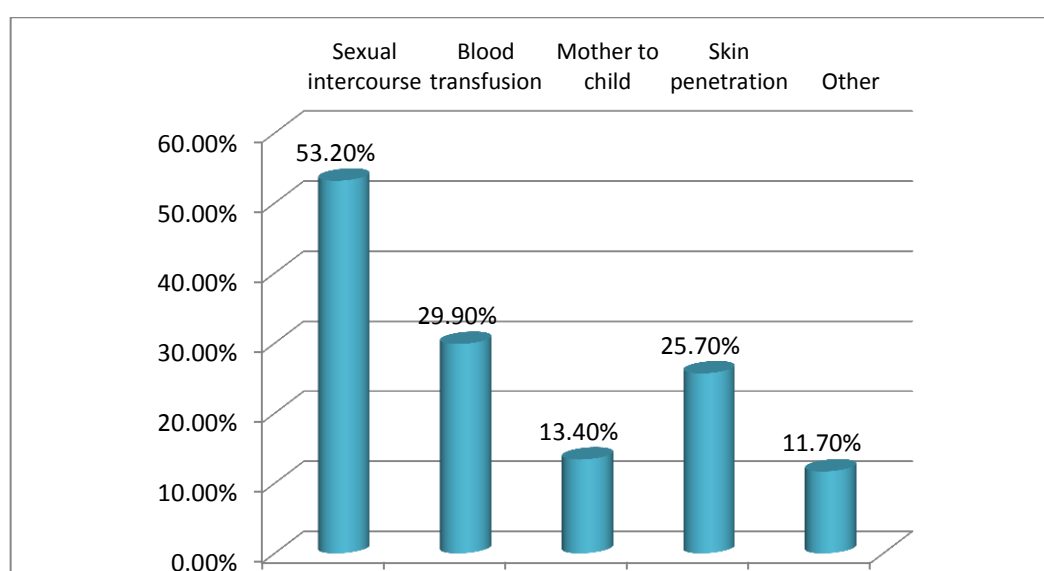
infected. As a result, the HIV/AIDS pandemic has orphaned over 12 million children in Africa (Mbirimtengerenji, 2007).

In Sudan, the National Council on HIV and AIDS (NAC), the National Executive Council on HIV and AIDS (NECHA) and (SNAP), play an essential role in the coordination of the national response to the HIV epidemic. NAC is the highest policy and consultative institution for all issues and subjects related to HIV and AIDS. NECHA coordinates partners and stakeholders from key sectors in reviewing, revising and endorsing strategic plans and action plans, mobilising resources, monitoring and evaluating the national response. SNAP serves as a secretariat to NAC and NECHA and is responsible for national policies, planning and coordination. At the state level, the State AIDS Programmes (SAPs) are responsible for the planning and implementation of HIV related activities in the field (SNAP, 2010).

SNAP has a well-established and strong partnership with different UN agencies, which facilitate the implementation of sustainable responses, financially and technically. SNAP is represented in internal structures of some of the coordinating institutions such as the Youth and the Women's Coalitions. SNAP, with support from UNAIDS, has also established the Sudan AIDS Network (SAN), which coordinates all national and international NGOs. It also plays a lead role in encouraging the establishment of People Living with HIV associations (PLHIV). Furthermore, SNAP is monitoring the provision of HIV prevention, treatment and care services in health facilities.

The HIV/AIDS control programme has 142 centres for voluntary counselling and testing (VCT). Thirty-four centres (34) offer free Anti-Retroviral Treatment (ART), and 257 Centres offer Prevention of Mother to Child transmission Treatment (PMTCT) (SNAP, 2014). Free treatment of Sexually Transmitted Infections (STI) and distribution of condoms are provided through 400 health facilities (SNAP, 2010).

In 2002, a 5-year national strategic plan on HIV was developed for Sudan covering the 2002 to 2007 period. Evidence-based information was collected to form this strategy by carrying out epidemiological and behavioural surveys in fourteen states. The surveys showed the prevalence of HIV/AIDS in Sudan at 1.6 percent (Khamis, 2013). The main mode of transmission was sexual contact (see Figure 1.3). Limited epidemiological surveys in various parts of Southern Sudan have found a prevalence of 1 percent to 4 percent among samples of adults and the general population, particularly among outpatients and pregnant women.



Source: Sudan National AIDS Control Programme (National Strategic Plan, 2002-2007)

Figure 1.3: Mode of Transmission of HIV/AIDS in Sudan

The HIV epidemic in Sudan is that of a concentrated epidemic among high-risk populations, namely men who have sex with men (MSM), Injecting Drugs Users (IDUs), and Female Sex Workers (FSWs). Concentrated epidemics are well-defined as HIV epidemics in sub-populations with known high-risk behaviours where HIV prevalence is consistently above 5 percent in at least one high-risk group.

Data from the Sudan (United Nations General Assembly Special Session on HIV/AIDS (UNGASS) report indicated that 117,109 adults (ages 15 years+), 67,661 women (ages 15 years+), 5,107 children (ages 0-14 years) and 27,888 AIDS orphans (ages 0-17 years) currently living with HIV/AIDS in Sudan (UNAIDS, 2010).

The Republic of South Sudan is in a state of generalised HIV epidemic, which is defined as an epidemic with HIV prevalence consistently more than 1 percent among pregnant women (UNAIDS, 2012). In South Sudan, HIV has a much more serious spread and a relatively large part of the population is already affected (Abu-Raddad, LG., et al., 2010). In addition, HIV prevalence is estimated to be eight times higher than that in North Sudan, with a prevalence rate of 3.1 percent. Estimates range from 2.1 percent to 4.2 percent among adult population aged between 15 to 49 years old.

The health services in Sudan are provided by health sub-systems like insurance schemes, armed forces, and private providers. For provision of service, healthcare is organised at primary, secondary and tertiary levels. The national health insurance fund, in addition to being an actor for financing, has its own health facilities. The country has also reviewed health system financing using the organisational assessment for improving and strengthening health financing system (OASIS) approach as a prelude to framing its national strategy for health financing (WHO, 2014).

The health system suffers from poor human resource retention, and an inequitable distribution of health workers and the skilled workforce needed to deliver the essential health services. Over 70 percent of the health workforce is located in urban settings, reducing the availability of skilled workforce in rural areas. An analysis of health system financing indicates that almost all is out-of-pocket expenditure (SNAP, 2010).

With regards to HIV/AIDS, the Global Fund accounts for more than 90 percent of the overall HIV/AIDS spending in Sudan. \$63 million (equivalent to 567 million

SDG) is needed to finance HIV activities in selected areas of the country. The Global Fund covers almost 22\$ Million (35%), leaving a funding gap of 65%. The Ministry of Health represented by SNAP provided 17.7 percent of the HIV services (almost 10% less than what the programme had provided in the previous year), while the rest of the government entities such as the Ministry of Social Welfare, Ministry of Justice and Ministry of Industry, provided less than 1% of the services. The funds were mostly allocated for programme management, either from a multispectral source of funds or from the government .

However, the updated national strategic plan (2014-2017) showed that strengthening strategic information, prevention, care and treatment, supportive social, legal, institutional & addressing HIV/AIDS in humanitarian settings policy environments, strengthening governance and institutional and organisational capacity, positive health, dignity and prevention for PLHIV were the most prioritised activities in combating HIV/AIDS in Sudan (SNAP, 2014).

Among infectious diseases, both tuberculosis (TB) and HIV/AIDS represent global public health crises. Both diseases have been labelled diseases of poverty. Their mutually detrimental effect on the individual patient and at the population level is most obvious in Sub-Saharan Africa (WHO, 2005).

In 2013, 5,367 TB patients were tested positive for HIV from a total of 20,181 TB cases notified across Sudan. The low coverage (26.6%) of HIV testing among TB patients can be attributed to several reasons including reluctance in implementation of providing and initiating testing and counselling services (PITC) in tuberculosis management units (TBMUs); only 137 out of the 327 TBMs are providing HIV testing to TB patients; and frequent shortages in HIV testing kits. Out of the 5,367 TB patients tested for HIV, 325 were HIV positive (6%) (SNAP, 2010).

Although there is progress in HIV testing among TB patients, current rates of testing are far from the universal coverage of PITC in TBMUs. On the other hand, linkage to ART services of HIV positive TB patients remains weak mainly due to the failure of establishing effective referral mechanisms between TBMUs and ART centres. This indicates the weakness of addressing the TB/HIV collaboration activities in Sudan, which increase the vulnerability of those infected with TB and HIV to poverty (SNAP, 2010).

1.2.2.2 Poverty: Status and Trends

In key studies on global poverty, the World Bank (2001) estimated that 1.2 billion people survived in poverty. Hughes et al. (2004) reported that 1/5 of the world's population (about 1 billion people) survive on less than US\$ 1 per day. Another 1.8 billion people live on only US\$ 2 per day. Approximately 1.3 billion people are deprived from good sanitation and clean water, and above one-half of the less developed world's population (2.6 billion people) is without access to proper sanitation.

The majority of the world's deprived people are women and children. Women constitute up to 70 percent of the world's poor with most of them living in rural areas (Moghadam, 2005). Between 600 and 700 million children representing approximately 40 percent of all those in the under developed countries are poor. Additionally, a reported 1 billion people in the developing world are uneducated. More than 110 million children of school going age were out of school (UNICEF, 2000) with a drop in school enrolments, mainly at primary level due to poverty and the rate of school dropouts is higher among girls than boys (African Development Bank, 2013).

In terms of proportion of the poor, poverty has seen rapid increase. Recently, the percentage of Sub-Saharan Africans living on less than US\$ 1.25 a day has

marginally declined from 56.5 percent in 1990 to 48.5 percent in 2010 but has not yet achieved the MDGs goals. In 2012, the global economic growth slowdown led to a reduction in the employment rate from 61.3 percent in 2007 to 60.3 percent in 2012 (UNDP, 2013).

Low wages coupled with low production and the slowdown of most of African economies, constrained inclusive economic growth and provided unequal opportunities to reduce poverty (African Development Bank, 2013). In addition, the gender gap in employment indicates a 24.8 percentage variation between men and women. Food insecurity is widespread and this aggravates hunger and malnutrition.

In Sudan, the estimated prevalence of poverty was 46.5 percent and the overall inequality measured by the Gini.-coefficient was estimated at 0.353. This could be said to be relatively moderate compared to countries in the same level of development in Sub-Saharan Africa and the Middle East (UNDP, 2010). Sudan faces some of the most complex and humanitarian challenges, many factors driving poverty in Sudan, such as new clashes over the control or simple access to resources and water. This results in huge displacement that leads to loss of income as families move away from their traditional homes and work and are forced to find alternative, and often not lucrative work in urban areas (mainly Khartoum state). On the other hand, the countless political divisions have spurred appropriation of resources at the local level and caused new clashes. This throws countless more people into poverty. (Stewart, 2002).

Patey (2010) stated that governance at national, regional, and local levels has mostly failed to manage the harmful political and economic effects of the resource curse that remain critical sources of armed conflict. Major root causes of poverty in Sudan include economic and social inequalities, high unemployment and low income, and environmental degradation. In addition, environmental pressure tends to make

people prone to violence as they seek alternatives to desperate situations (Stewart, 2002).

Whitney and Klaassen (2007) stated that these conflicts have caused a mass influx of internal IDPs to move from rural to urban areas. Sudan is home to 5 to 6 million IDPs and over 159,000 refugees from surrounding countries such as Chad, Eritrea, and Ethiopia due to wars in those countries. They often experience food insecurity as their income fluctuates and have minimal access to healthcare.

More than half of the people in Darfur are directly or indirectly affected by a conflict that has destroyed the region's infrastructure (Sudan Household Health Survey, 2006). The cumulative number of displaced people affected by conflict, disease, and climate change, and the lack of opportunity as well as isolation, aggravated the poverty levels in the country. Meanwhile in the east of Sudan, chronic food insecurity, underdevelopment and occasional internal fights are major concerns (World Food Programme, 2001). The Sudan Household Health Survey (SHHS) in 2006 found that 32.2 percent of children under five were moderately underweight (UNDP, 2012). Sudan is one of the countries with most of its population living in extreme harsh conditions (UNDP, 2000).

The poorest population were those living in rural areas, where women and internally displaced people constitute about 12 percent of such a population. About 50 percent of the rural labour force is involved in agricultural activities (UNDP, 2010).

The annual population growth rate of Sudan is 2.6 percent. The literacy rate in the country is estimated at 73 percent for men and 52 percent for women. Life expectancy is estimated at 56 years for male and 60 years for females (UNDP, 2012). During the last two decades, the country has witnessed a considerable increase in urbanisation resulting in lifestyle changes and expansion of towns (SNAP, 2010). Prior to the breakaway of South Sudan, Sudan had witnessed high economic development

fuelled by oil exports and foreign direct investments (FDIs), but the economic growth remains unstable and significant regional inequalities persist due to the political instability (SHHS, 2006).

The low growth of the economy, high rate of unemployment and low levels of productivity remain the main cause of high and persistent levels of poverty in Sudan. According to the available recent data from UNDP (2012) and in terms of labour force contribution, males constitute 38.3 percent while the share of females remained at 14.1 percent.

1.3 Problem Statement

Poverty and HIV/AIDS have the ability to reverse the developmental processes in Sudan. The shared negative impacts of these two problems can present an even greater burden and challenge for the country. Poverty has overwhelmed the country for decades in spite of national and international technical and financial efforts to eradicate it, and has been a main hindrance to its development prospects (World Bank, 2003). There is a lack of information in Sudan on the risk of HIV and its relation to poverty (SHHS, 2006). Data constraints in Sudan are severe in terms of both quality and comprehensiveness (SHHS, 2006).

The comprehensive poverty reduction and growth efforts and strategies in Sudan make several references to HIV/AIDS (UNDP, 2012). However, these references are made only in relation to health sector interventions. They do not include HIV/AIDS interventions aimed at providing support for those who are deprived and susceptible to HIV. In poor countries like Sudan, having suffered from prolonged civil war and political instability will clearly add further financial burden on the country.

In recent years, there has been an observed significant improvement in the understanding of the consequences of HIV and in the clinical management of

HIV/AIDS in Sudan. However, the socio-behavioural and economic factors that drive the HIV epidemic in Sudan are not well understood. Complex and location-specific social and economic factors driving the HIV epidemic remain even less recognised (SNAP, 2010). The consequences are increased sickness and death among deprived people within Sudan are still unfolding. Apart from the persistent fear, denial and stigma related to HIV in Sudan, there remains a lack of clarity on biological, socio-economic and development relationships and HIV, and what is known may be poorly implemented (SNAP, 2010).

Sudan is affected by major fluctuations in exchange rates and inflation due to its separation from the Republic of South Sudan. The inflation rate dropped from 14.3 percent in 2008 to 11.2 percent in 2009, and then increased to 42.1 percent in 2012 compared to 18.1 percent in 2011 (see Table 1.3). This result in a deterioration in government spending on health in Sudan translating into an increase in the number of untreated people. According to the Global Health Expenditure Database, government expenditure on health was 16.7 percent of total government expenditure in 2009, 12.9 percent in 2010, 17 percent in 2011 and 13.1 percent in 2012 (WHO, 2014). With regards to the health system, there are challenges pertaining to prescribing and treatment practices, and considerable variation between facilities coupled with a general lack of compliance with health policies.

While prevention must remain a main concern, the reality is that the impact of the disease must be mitigated. These include sickness, death and being orphaned (Barnett et al., 2002). Documented evidence of the process of mainstreaming HIV/AIDS in national development instruments to illustrate the wide reaching effects of the pandemic is limited such as education, gender equality. While national efforts in Sudan concentrate on technical inputs such as vaccines or treatment, efforts need to be

expanded on sensitising the population on the real effects of HIV to reduce its prevalence.

1.4 Rationale for the Study

This thesis sets out to establish and clarify the empirical relationship between poverty and HIV. This study builds upon valuable theories as it pertains to these issues, and provides important data about ways in which the Sudanese people's vulnerability to HIV-risk are shaped. Risk is defined as the possibility that an individual may contract HIV. Certain behaviours create heightened risk. Instances include unprotected sex with a partner whose HIV status is unidentified; multiple unprotected sexual partnerships; unused of condom as prevention and determines the factors that expose them to HIV-risk. (UNAIDS, 2008).

Vulnerability results from a variety of factors that decrease the capability of persons to avoid HIV. These may include lack of knowledge and skills required to protect from HIV; inaccessibility of services due to distance, cost etc.; social and cultural norms, practices that stigmatised certain populations, and considered as barriers to important HIV prevention messages (UNAIDS, 2008).

Several studies have already investigated the relationship between poverty and HIV/AIDS in Sub-Saharan countries with high HIV prevalence. At the theoretical level, the study partially addresses the significant bias towards the large cache of literature that exists in severely HIV affected countries and regions (Greener et al., 2007; Thabo, 2010; Surat et al., 2007; Jere, 2012). This thesis attempts to fill the gap in this area.

HIV/AIDS needs to be officially included in the Sudanese government's efforts to reduce poverty. This study attempts to contribute to both knowledge and understanding of what may constitute one of the worst problems to development efforts

in Sudan, by addressing the failure to consider socio-economic information in healthcare planning which may result in a gap between policy-makers and programme implementation at the national and local levels.

This study attempts to achieve this by collecting information related to the social and economic factors that may influence the Sudanese population and women's vulnerabilities to the risk of HIV. The results from this thesis provide significant empirical evidence of the importance of gender inequality in the spread of HIV in Sudan. Worthy of note is the fact that by making this information available to top health planners, this work attempts contribute to improving the design and quality of socio-economic information programmes and poverty reduction strategies. Further, information derived from this thesis such as the socio-economic factors that drive the epidemic, and the impacts of this disease are expected to be valuable to government policy planners, international agencies, NGOs, and various key stakeholders in development and the health sectors in Sudan especially those related to HIV/AIDS.

In addition, this study intends to identify the impact of HIV/AIDS on development in Sudan, the result of which should be useful for researchers interested in AIDS and development studies. As noted, HIV/AIDS is not only a health problem but also a development problem (Hughes et al., 2004).

Finally, the empirical results emerging from this research support and highlight the importance of the current policy initiatives of UN agencies working in Sudan such as UNDP ,UNAIDS, UNFPA, WHO and UNICEF.

1.5 Research Questions and Objectives of the study:

1.5.1 Research Questions

This thesis provides an interpretative analysis of the relationship between poverty and HIV/AIDS in Sudan. The following research questions have been formulated to guide the research.

- i. Does low economic status as a characteristic of poverty increase vulnerability to HIV high-risk behaviours in Sudan?
- ii. Do low levels of education increase vulnerabilities to HIV high-risk behaviour?
- iii. How does poverty affect women's vulnerability to HIV high-risk behaviours?
- iv. What are the essential coping strategies that affect the utilisation of savings of PLHIV and to what extent does it aggravate poverty?
- v. Are there significant differences in the coping strategies between women and men affected by HIV/AIDS?

1.5.2 Research Objectives:

HIV epidemic is not an isolated event as illustrated. It is a predictable result of political instability, declining economies, food insecurity and inadequate investment in water, sanitation, healthcare, and education. As a result, infection levels and prevalence rates have increased, highlighting the need to intensify and refine the focus of prevention efforts concurrently with poverty reduction strategies. This underscores the need to redouble efforts to reduce the impact of HIV/AIDS and alleviate poverty.

Thus, there is a need for accurate behavioural and socio-economic data to understand the factors that make people in Sudan more vulnerable to the risk of HIV and investigate its impact. To this end, the general objective of this study is to investigate the relationship between poverty and HIV/AIDS in Sudan. In concise terms, the specific objectives of this study are:

- i To examine the relationship between economic status and HIV high-risk behaviours;
- ii To examine whether a lack of education increases vulnerability to HIV high-risk behaviours;
- iii To determine whether poverty associated with gender inequality makes women in Sudan more vulnerable to HIV high-risk behaviours;
- iv To assess the coping strategies among PLHIV and its impact on savings and poverty aggravation;
- v To inspect whether there are significant coping strategy differences between men and women affected by HIV/AIDS in Sudan.

1.6 Scope of the Research:

The purpose of this study is to examine and investigate the relationship between poverty and HIV/AIDS in Sudan. The following approaches have been employed in

attempting to investigate the casual relationship between poverty and HIV/AIDS including the material or structural conditions, and the behavioural or lifestyle approaches. This research focuses on the vulnerability of the people in Sudan to HIV-risk behaviours.

It also focuses on the socio-economic implications of HIV and coping strategies among HIV/AIDS infected people in Sudan. The study was conducted in the seven States of Khartoum, Red Sea, Kassala and Gedarif (East of Sudan), South Kordofan, West Darfur (West of Sudan), and the Blue Nile (Centre of Sudan). These states were selected due to high prevalence of HIV (SNAP, 2010). The study used three data sets in order to achieve its objectives; the study conducted primary survey among PLHIV, employed data from the Sudan Household Health Survey 2010 and conducted focus group discussions among PLHIV to supplement the data.

1.7 Thesis Structure

This thesis has been structured into eight chapters to explore the relationship between poverty on HIV/AIDS in Sudan. Below is a brief outline for each chapter:

Chapter	Brief Outline
Chapter 1 Introduction	This chapter serves as an introduction to this thesis and provides a broad overview on how the work is presented. It defines the research background and clarifies the rationale for pursuing this work. In addition, it provides an extensive overview of the approach applied and illustrates the objectives and questions raised by this study. The chapter concludes by introducing the structure of the thesis
Chapter 2 Literature Review	Chapter two explores relevant previous literature on the relationship between poverty and HIV/AIDS. The chapter consists of three main sections. The first section discusses the vicious circle of poverty and HIV/AIDS and theories and evidence. The three theories pertinent to this study are drive theory, livelihood theory and structure theory. The second section discusses the impact of poverty on HIV/AIDS to observe the role of poverty in making people vulnerable to HIV risk behaviours. The review includes studies on the relationship between socio-economic characteristics of poverty and HIV behaviours. The third section discusses the impact of HIV/AIDS on poverty and the ways in which the socio-economic impact of HIV/AIDS combines to produce a vicious circle of poverty and HIV/AIDS that further negatively impacts the affected households. It also reviews the conceptual framework on the relationship between poverty and HIV/AIDS

Chapter 3 Methodology	This chapter examines the research design utilised in the work which is the mixed method approach and research conduct strategy. The research strategy includes data collection methods (quantitative and qualitative). The data collected consists of three (3) data sets: primary survey among people living with HIV; Focus Group Discussions among PLHIV to supplement the survey data; and data employed to analyse the Sudan Household Health Survey (SHHS, 2010).
Chapter 4 Impact of Poverty on HIV/AIDS among Men in Sudan: Findings from the 2010 Sudan Household Health Survey	In this chapter, the impact of poverty on HIV/AIDS among Sudanese men is discussed. The point of emphasis is on how poverty increases people's vulnerability to HIV. This chapter focuses on the analysis of the findings from the Sudan Household Health Survey and the FGDs, to examine whether the findings achieve the objectives of the study.
Impact of Poverty on HIV/AIDS among Women in Sudan: Findings from the 2010 Sudan Household Health Survey	Here we discuss the impact of poverty on HIV/AIDS among Sudanese women focusing on how poverty exposes people to HIV. The chapter analyses the findings from the Sudan Household Health Survey and the FGDs to examine whether or not the findings address the objectives of the study.
Chapter 6 Coping strategies	This chapter focuses on the analysis of the impact of HIV/AIDS on

**among
people
Living With
HIV/AIDS**

poverty, and analyses the survey results and the Focus Group Discussions among people living with HIV. The objective is to identify the coping strategies with the disease impact as well as the behaviour and feeling towards the infection. Attempts at answering the research questions and achieving the research objectives are made here.

**Chapter 7
Conclusion
and Policy
Implications**

It will be right to assert that the interrelationships between poverty and HIV/AIDS have vital policy implications. Thus, the discussion in this concluding chapter concentrates on summarising and highlighting the main findings of the PLHIV survey and the Focus Group discussions and the findings from the analysis of the Sudan Household Health Survey. The chapter attempts to suggest some recommendations and policy implications by contributing in full or part, in poverty alleviation efforts and reduction of HIV prevalence in Sudan. Contributions and limitations of the study are also presented in this chapter.

CHAPTER 2

Literature Review

2.1 Introduction

WHO (2003) stated that health is a valuable and crucial asset for people and that ill health is often highly associated with poverty. The reason can be deduced from the loss of income associated with ill health occasioned by high healthcare costs and loss of work hours. Thus, investment in healthcare is essential for economic development. Poverty exposes people to various health hazards and infectious diseases such as malaria, diarrhoeal diseases, tuberculosis and risks through malnutrition, and lack of basic amenities (Pattanayak & Paff, 2009).

The relationship between HIV/AIDS and poverty is complicated. It is essential to understand the ways in which living with HIV and AIDS may aggravate poverty. The HIV epidemic has the ability to upthrow and changes the complex relationships between the poor and the rich, through depletion of income, asset distributions and intensification of social exclusion processes (Collins & Rau, 2000). Poverty can be defined beyond income levels and in either relative or absolute terms. Absolute poverty is a state of extreme deprivation characterised by people's inability to meet their basic needs of life. This view is less concerned with the overall level of inequality in society. This concept ignore that people have social and cultural needs (Iceland, 2005).

Relative poverty is defined in relation to the economic status of the people in the communities or countries, where they are considered poor from the viewpoint of the societies in which they live. This therefore differs between countries and overtime people viewed under this angle of poverty may not be found lacking in income, but

they do not have the ability to access resources as they may lack the capabilities to engage in various social activities and aspirations. These can well include their rights, representations and governance (Yekaterina et al., 2012). People are considered relatively poor if they fall below the prevailing standard of living of a given society. Poverty may influence people's behaviour and make them vulnerable to HIV particularly through engaging in sex work, injection of contaminated blood or using contaminated instruments and cultural practices such as FGM (Dibua, 2010).

This chapter reviews a wide range of relevant and related literature. It looks at the relationship between poverty traits and HIV/AIDS. The aim is to extract a set of hypotheses that will form the framework upon which this thesis will approach and examine the relationship. Having established the research questions in chapter one, it is important to review the relevant theories and empirical work to answer these questions. Thus, this chapter will assist in identifying the different factors that make people vulnerable to HIV, and how HIV/AIDS deepens poverty, thereby strengthening the analytical basis of this thesis.

The present chapter consists of six various sections. Section 2.1 provides brief introduction and the organization of the chapter. Section 2.2 discusses the vicious circle of poverty and HIV/AIDS predicated upon theories and evidence. It also examines the three theories pertinent to this study namely: (1) Drive theory; (2) Livelihood theory; and (3) Structuration theory. Section 2.3 discusses the impact of poverty on HIV/AIDS and whether poverty makes people more vulnerable to HIV. Section 2.4 investigates the impact of HIV/AIDS on poverty and to what extent the socio-economic impact of HIV/AIDS combines to generate a vicious circle of poverty affecting many households. Section 2.5 illustrates the conceptual framework of the relationship between poverty and HIV/AIDS and underline the hypotheses of the research. Section 2.6 provides a brief summary.

2.2 Vicious Circle between Poverty and the HIV/AIDS - Theory and Evidence

Concerning the relationship between poverty and HIV/AIDS, many researchers have argued that poverty at both individual, household levels and their related characteristics increases vulnerability to HIV risk (Whiteside, 2002; Barnett et al., 2001; Booyson & Bachmann, 2002; Booyson, 2004; Whiteside & Sunter, 2000; Wojcicki, 2005). Such characteristics include low levels of education, low marketable skills, lack of knowledge concerning HIV risk behaviour and limited resources to act on this knowledge. In addition, gender inequality, that engender socio-economic dependence on men, coupled with certain cultural practices that deny women's power to negotiate or deny sexual approaches make women most vulnerable (Allin et al., 2009; Garcia-Moreno & Watts, 2000).

According to Balyamujura et al. (2001), poverty relates to the spread of HIV in three interconnected ways:

- (1) The root condition of structural poverty, which is driven by gender, and land ownership inequality, racial and geographical segregation, and limited access to economic resources and services;
- (2) Developmental poverty, which is generated due to various unpredictable socio-economic and demographic factors such as fast population growth, environmental degradation, rural-urban migration, destruction of communities, rapid urbanisation and marginal agriculture; and
- (3) Poverty created by war, civil unrest, social breakdown and increasing numbers of refugees. High levels of violation and the breakdown of traditional sexual morals are associated with military instability, refugee crisis, displacement and civil war (Walker, 2002).

Numerous theories explain and clarify the relationship between poverty and HIV/AIDS. To achieve the objectives of this research, this study draws upon the following three theoretical frameworks as guides; the Drive theory; Livelihood theory and Structuration theory. These theories clarify how some dimensions of poverty are considered determinants of HIV/AIDS and investigate the coping strategies among people living with HIV and the effects on their living standards after infection.

2.2.1 The Drive Theory

To achieve the objectives of this study, drive theory was adopted to interpret the relationship between poverty and HIV/AIDS. (Tladi, 2006). This theory states that human behaviour is motivated by drives, which implies that individuals will lack the capability to survive without obtaining basic needs such as food and shelter. The notion of this theory indicates that every individual has physiological needs in life, which should be satisfied for survival. When these needs cannot be attained, a negative state of stress is created (Asdi-Lari et al., 2004). Accordingly, the drivers tend to grow overtime and operate on a feedback control system. When these physiological needs are achieved, the drive for these needs reduced, thereby relaxing the stress on the individual(s) concerned.

The strength of these drives depends upon the strength of the impoverishment and deprivation. Thus, in terms of poverty and vulnerability to risk, this theory argues that human beings in poor resource settings suffer from impoverishment. Deprivation creates needs, which activate and increases drive. Drives direct human behaviour, which may lead to inappropriate attitudes in achieving the goal as survival value (Tladi, 2006; Fayomi, 2009). As mentioned above, the low economic status and deprivation

may drive some people to behave in a way that increases their vulnerability of contracting HIV/AIDS.

The various poverty characteristics occur when the outcomes generated by the individuals are insufficient to meet their needs. An individual's needs are usually defined based on poverty line (external measure) or subjected by the individuals themselves (internal measure) which may include any of the scopes such as income, health, or life expectancy (Murali & Oyeboode, 2004). Individuals may feel discomfort from inadequacy because of a number of factors, such as lack of endowment and skills, resulting in a smaller number of available choices hence averting them from taking advantage of the wider range of opportunities.

According to Hull (1943) and Tladi (2006), there are primary and secondary drives. The primary drive is motivated by basic needs (food, shelter, sanitation), and the secondary drive is acquired according to the conditions of money (Donahue et al., 2012). It does not mean that money satisfies all needs, but it will reduce the drive on a regular basis. However, money in itself cannot reduce an individual's drives. This explains the behaviour of human beings, because if they are not able to satisfy their needs, they may engage in high-risk behaviours. Further, the theory argues that when a person takes any action, performs a duty or job, most of the time he/she does not know the reaction of others towards his behaviour. Based on this, a negative state can be seen as a reaction to social presence.

Moreover, due to poverty and the inadequate access to resources and opportunities in augmenting productivity, many poor people engage in income generating activities that may expose them to HIV risk. Absence and/or limited education and skills also have a great influence to HIV (Hargreaves et al., 2007).

This theory concentrates mainly on basic needs and primary drivers. To strengthen this area, we used the structuration theory, to clarify how these factors may exposes people to risk.

The drive theory lacks generalizability. One of the major problems with this is that it does not account for how secondary reinforces reduced drives. In addition, it does not explain why people engage in behaviours that do not reduce drives. This theory does not explain why people seek activities that do nothing to fulfil biological needs and that expose them to risk. Thus, this theory cannot account for such behaviours. More suitable theoretical insight into the individual/structure relationship within the context of HIV/AIDS can be gained through structuration theory.

2.2.2 The Structuration Theory:

Another theory that explains the study was Giddens's structuration theory (Long, 2001). This theory contradict the drive theory, and states that assets inherent in a specific environment do not cause a certain behaviour, but influences behaviour which is dependent on the individual, and vice versa. This theory relies upon the concept of the relationship between individuals and society. Giddens asserts that the individual's innate ability in taking a decision, acting and performing on it, is the individual's greatest asset. This indicates that an individual's role in society is socially structured and varies within different segments of societies and social groups of diverse lifestyles and cultures. Human behaviour is an important tool for analysing the behaviour of individuals in the context of their social, economic and cultural environments (Green, E., et al., 2006). However, this theory stated that the social system would be reproduced only by the knowledgeable individual agency, which is ignored those have limited knowledge.

Giddens' structuration theory provides an insight into the influence of behaviours such as change of places, gender and socio-economic characteristics. Sexual behaviour decisions are influenced by external factors beyond the human control, such as religious ethics, social customs, and socio-economic status of a person in the society. Condom use in Sudan faces major challenges at the social, cultural and religious levels. Moreover, sex negotiation and education are considered taboo. This will constrain prevention efforts and increase vulnerability to HIV (Moore & Oppong, 2007).

The theory also provides a deep understanding of the social implications of the HIV/AIDS epidemic. It is argued that place and environment plays a critical role in understanding the HIV epidemic. The epidemiology of the disease such as HIV/AIDS has to be undertaken in terms of the influences comprising the cultural characteristics of the affected person and the political – economic situation of the country under the study (Gillespie et al., 2007). This will help in identifying what factors may aggravate gender inequality problem in Sudan, and how it may expose people to HIV risk.

The theory was not related to the contemporary sexual practices from wider social and economic circumstances. Adherence to cultural norms makes the discussion of sex is very sensitive for women in many developing countries. Poor women were particularly vulnerable to HIV infections, due to lack of power to negotiate sex with their partners (Walker, 2002; Waterhouse & Vifjhuizen, 2001; Moore & Oppong, 2007). A survey conducted in Bangladesh reported around hundred (100) FSWs engage in sex work due to financial constraints (Islam & Conlgrave, 2008). Sex workers carry a high-risk of HIV and consequently a greater probability of adverse outcomes. FSWs were considered as a high-risk group in the transmission of HIV/AIDS pandemic, and act as a bridge in transferring the virus to the general population (Mbirimtengerenji, 2007).

Giddens' theory ignores political and economic contexts. It does not discuss the new conflicts in this emergent social order, but focuses only on individualist issues of personal identity and relations. An individual may gain power through various factors such as income, ethnicity, gender, class and social ranking in a community. However, all of these endowments at the same time can be destructive if grossly abused without taking proper precautions. People make rational decisions to engage in certain behaviours based on their own beliefs, choices anticipating positive outcomes after having engrossed in these behaviours (Ajzen, 2005). Another important theory that can strengthen the analytical framework of this study is the livelihood theory.

2.2.3 The Livelihood Theory:

Livelihood theory is defined as a way of living and comprises social and material capabilities, endowment, ability, assets, properties and activities (Carney, 1998). The household's livelihood outcome depends on the interaction of interconnected dimensions, such as the following (Tladi, 2006):

- (a) Livelihood assets: When a household is able to obtain its needed assets by building up different capacities, it stands a chance to deal with risk and uncertainties. Such assets include human, financial, physical, natural and social capital;
- (b) The vulnerability context, which involves exposure to risk, and breakdown of livelihood due to economic, structural and environmental factors above the household's control;
- (c) Livelihood strategies and;
- (d) Transforming structures and processes that reveal the level of government, private sector, and civil society involvement.

Figure 2.1 below shows how vulnerability influences household livelihood assets and how the ownership of these assets decreases vulnerability. If the livelihood

strategies lead to positive outcome, then the household will have the ability and capability to accumulate assets and decrease vulnerability and risks. When the livelihood strategies result in negative outcomes due to poor environment and weak institutional policies, it can lead to a reduction in poor people's assets, which could increase their vulnerabilities to risk and uncertainties.

In the case of poor households, the asset base is much more limited than that of rich households. This owes limited access to human capital assets, natural and financial resources, which make them more vulnerable to risk and trends. Socio-economic shocks also contribute to negative livelihood outcomes and decrease their assets, which results in severe poverty conditions (Sherbinin, 2008).

The framework demonstrates the processes of economic change that includes transition between different states of economic structures through changes in livelihood strategies. The framework describes the loss of resources in coping with the risk. This study makes systematic attempts to review empirical literature and theories.

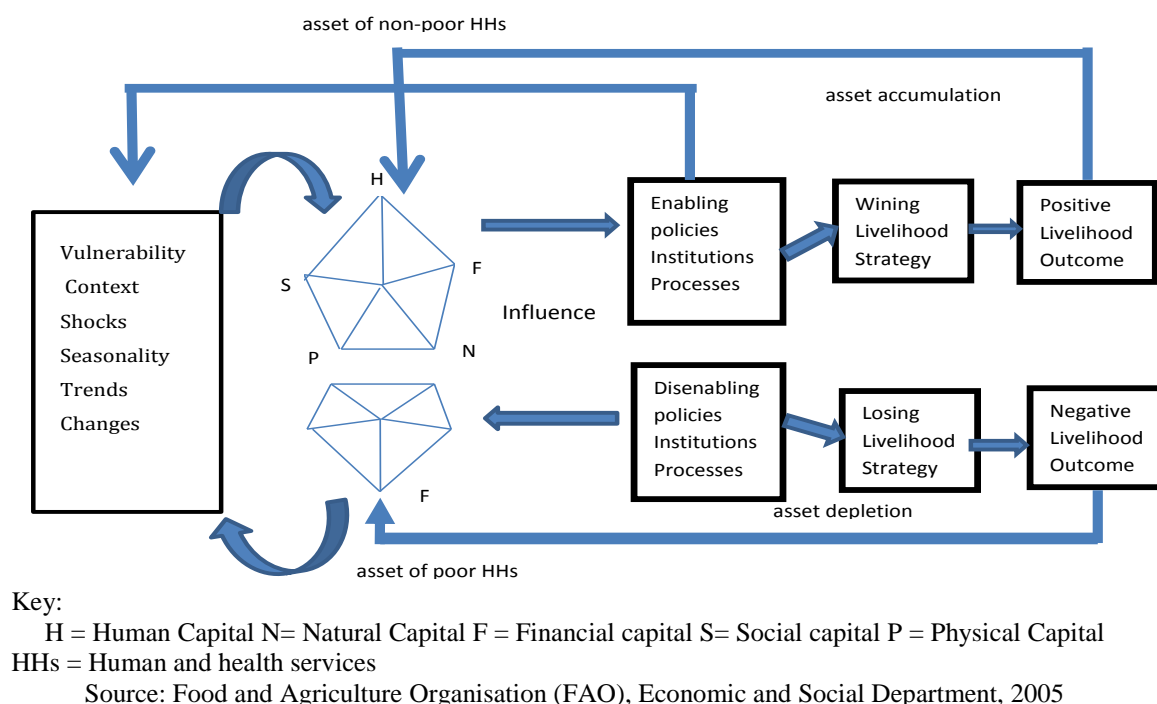


Figure 2.1: Sustainable Livelihood Framework

Different types of productive activities undertaken by households depend on the different types of livelihood assets available to them. These assets include human capital such as productive or marketable skills and financial assets (e.g. savings or cash), social and physical assets. Having financial support enables households and individuals to cope better with HIV/AIDS (Mbirimtengerenji, 2007).

The poorest people are the least capable to survive with the impact of HIV/AIDS. Even relatively wealthy people find their resources declined by their experience of the infection (morbidity and death), and there is increasing proof of cases rising among the contemporary urban communities ruined by the epidemic (Cohen, 2006). The livelihood approach does not go beyond material drives. By calling resources “capitals”, livelihoods were considered in an economic view, placing the emphasis on material aspects such as production and income, and analysing livelihoods in neo-liberal terms of economic investments and gains.

WHO (2005) reported that people from poor resource settings are most infected by the disease. They are exposed to infections, and poor families are trapped by the suffering, sickness and death caused by the disease. The effects include upsetting financial sufferings that lead to further depressed consequences. The impact of the disease on people’s livelihood and their life expectancy lead to negative levels of changes in patterns of economic and social behaviours (Nyirongo, 2012).

The concern in this research is the motivation and attitude besides vulnerability and capability. It attempts to explain how people in a society deal with disasters in terms of abilities and capabilities. The AIDS epidemic is considered a disaster in terms of its complex impact. The UNDP (2002) argument supports this thought, clearly illustrating that people are mainly motivated or driven by external factors, which are of economic, social and political environment. Thus, the framework proved extremely

useful in explaining poor people's livelihoods and their coping mechanisms in periods of crisis. However, it does not place sufficient emphasis on the informal structures and processes that affect access within the community. Moreover, it does not take account of structures such as government institutions as stated by the structuration theory. Thus, combining the three theories effectively would explain the relationship between poverty and HIV.

2.3. Review of Impact of Poverty on HIV/AIDS – The Vulnerability

The state of poverty is characterised by multiple levels of exposure and adverse, physical and cumulative social stressors (Evans & Meguel, 2007). Poverty is related to exposure to severe diseases like AIDS and its effects, decreases chances of accessing to healthcare services and constraining treatment adherence (Bates et al., 2004).

According to the livelihood theory, vulnerability means being exposed to a high degree of risk, stress, shock, fear and stigma, resulting in difficulties in life (Masanjala, 2007). Poverty-related conditions that emerge from unequal distribution of income causes deprivation and suffering among poor people. This includes malnutrition due to protein and iron deficiency and decreases energy level and vitamin A intake leading to reduce resistance to disease in general and HIV in particular (Stillwagon, 2001).

Cohen (2006) cited two examples of how poverty leads to consequences that may expose poor people to HIV. Firstly, migration as a livelihood strategy is associated with higher levels of risk of HIV infection due to separation from family and spousal/sexual relationships. The inability to access sustainable livelihoods, results in labour mobility, which in itself creates conditions where HIV transmission occurs. Migrant populations consist of large numbers of adults and young individuals who part from traditional, cultural and social linkages (Weine & Kashuba, 2012). In the new

status they may undertake or be drawn into risky sexual behaviours, manifesting consequences such as of HIV.

Secondly, poorer women who are divorced or widowed are often forced to engage in sex work for economic reasons to meet their family needs (Mbirimtengerenji, 2007). Levirate marriage and/or widow inheritance are such instances here. Evidence suggests that wars and conflicts create conditions of mass civilian displacements that facilitate the spread of HIV (Hakan et al., 2011). Conflicts create a situation that makes the population vulnerable to HIV through experiences of sexual (often rape) and physical violence, forced displacements, breakdown in the rules of law and economic survival. To explain the impact of poverty on HIV, we need to examine previous studies in depth to determine how poverty with its multi dimensions and characteristics renders people vulnerable to HIV.

2.3.1. Characteristics of Poverty and Vulnerability to HIV/AIDS

Several studies support the concept of multi-dimensional nature of poverty that goes beyond economics and limited consideration of income and consumption as described by the structuration theory (Skalli, 2001; UNICEF, 2011; Wagle, 2005). However, in practice the fiscal approach mostly maintains its dominance in descriptions and analysis at national and international levels (Laderchi et al. 2003).

The UNDP (2010) reported that multi-dimensions of poverty correspond to three main measures mentioned below:

Health dimension related to people deprived from malnutrition and child mortality.

Educational dimensions, if none of the members of the household complete 5 years of schooling, or a child is out of school.

Standard of living dimension, if the household is deprived in terms of drinking water, sanitation, flooring, cooking, electricity and assets.

With regards to this, and in line with theories that explain the purpose of this study, the present study attempts to discuss some characteristics of poverty that may increase people's vulnerabilities to HIV in the light of previous studies such as education, economic status, food insufficiency, gender inequality, and offer insights as to how high risk behaviours may derived by poverty and how it may expose people to HIV.

2.3.1.1. Education and Vulnerability to HIV/AIDS

As explained by drive theory, because of poverty, people become increasingly exposed to HIV/AIDS risk and this is compounded if they continue to lack access to the necessary facilities that reduces the risk of HIV (Kürschner, 2002). Several studies have discussed the relationship between education and HIV/AIDS with the majority finding negative relationships (Hargreaves et al., 2007; Glynn et al., 2004; Gregson et al., 2001). According to the World Bank, improvement in health can be achieved through acquisition of skills that will permit people to participate actively in a community and the economy as well as play a role in increasing productivity. These can be achieved by attainment of at least a basic education at primary and lower-secondary levels (Jere, 2012).

There have been some contradictory thoughts regarding the association between education and the spread of HIV. Most of these studies indicated greater risk of HIV among the deprived people because of poverty-related characteristics of low level of education and low awareness on precautionary measures (Tladi, 2006; Fako, 2010; Walque et al., 2005). Although many studies stated that educated people were more likely to have numerous partners and are mostly mobile, but they were more likely to

use condoms as a protective method that decreased vulnerability (Oni, 2005; Glynn et al., 2004).

A study conducted among 1,294 students in Botswana from secondary and tertiary educational institutions reported that low level of education and low scores in school were associated with sexual activity among teenagers (Tladi, 2006; Jere, 2012; Hargreaves et al., 2007). These studies investigated the association between changing HIV prevalence with condom use and education, without investigating the socio-economic factors behind such behaviours. Further, De Walque et al. (2005) using cohort studies (1998/1999 and 1999/2000) in Uganda, found significantly lower risk of HIV-1 due to increased use of condoms among educated individuals. Individuals that are more educated reported a higher level of condom use.

Barrnighausen et al. (2007) reported a negative association, and noted that one additional grade of educational achievement reduces the HIV by 7 percent. Similar findings were found in South Africa where those with higher educational qualifications had lower rates of HIV compared with illiterates and those with only primary school level of educations (Shisana et al., 2004). This indicates that, people with higher educational qualifications tend to have better information about HIV and are more likely to adopt preventative measures to reduce their risk relative to low educated persons (Mwambete & Justin, 2011).

Additional cross -sectional studies among 796 adults in Swaziland reported that women that are more educated were less likely to engage in high-risk behaviour (Weiser et al., 2007. In contrast, Oni (2005) reported that despite the high level of education in Botswana, risk to HIV can increase if people engage in unprotected sex due to irregular use of condoms and change partners to gain money, gifts or clothes (also see Fylkesnes et al., 2001). This shows the importance of the economic status in

relation to HIV risk and a higher level of education in most circumstances secured health independently of income and is generally protective (Greener & Sarkar, 2010).

One important mode of HIV transmission is through a mother's breast milk and there is clear evidence that this route infects a significant number of babies in Africa (McIntyre & Gray, 2002). This mode of transmission is avoidable with adequate education and knowledge of preventive methods. However, poverty is a major barrier in accessing preventive methods that drastically reduce transmission to babies through breast milk (Dyson et al., 2005). This is due to the lack of knowledge of the potential transmission of HIV via breast milk, and that poverty renders the family vulnerable through the inability to purchase baby formula. Moreover, access to clean water is required, in addition to understanding the importance of changes in such a practice. Neither clean water nor the finances to buy baby formula milk are within the easy reach of the poor (Cohen, 2006).

2.3.1.2 Economic Status and Vulnerability to HIV/AIDS

The livelihood strategy shows that vulnerability has many dimensions, including economic, social, demographic and political. It is not only the poor people who are vulnerable, but also the wealthy (Gillespie et al., 2007). However, the poor tend to be more vulnerable because they suffer much more from the crisis due to little or no savings or limited resources and income.

A number of studies have proposed that poverty may increase the risk of possible exposure to HIV through an increased tendency for high-risk behaviour and forces individuals into labour migration and sex work (Luke, 2005; Collins & Rau, 2000; Booyesen & Bachmann, 2002; Wojcicki, 2005). In line with drive theory, if people do not meet the needs to acquire the necessities of life, this generates negative emotions such as worry, fear, concern, and restlessness (Hull, 1943; Tladi, 2006). Thus,

those concerned tend to behave in such a way that can necessitate a forceful entrance into uncertain circles, and consequently exposure to risks. For instance, young boys and girls from poor families have been reported to have difficulties in adjusting to long-term risk management. Dinkelman et al. (2007) found that among 4,752 boys and girls in South Africa, economic problems, irregular sex partners and increasing poverty rate contributed to high HIV prevalence.

A cohort study conducted to examine the association between wealth index and HIV incidence, mortality and high-risk sexual behaviour in Zimbabwe, found that the greatest decreases in HIV prevalence occurred within demographics with the highest wealth. Mortality rate was significantly lower at higher wealth indexes (Lopman et al., 2007). This indicates clear association between higher wealth index and increased HIV prevalence as found in some Asian countries such as India and Cambodia (Greener & Sarkar, 2010).

There is an observed robust and clear relationship between income inequality and HIV prevalence among various countries. In Sub-Saharan African countries and to a lesser extent in Asia and Latin America, higher HIV prevalence was greater amongst those in low-income bracket (Gillespie et al., 2007; Fox, 2010). Risky sexual behaviour was higher among women from poorer households compared to wealthier ones (Bachmann & Booyesen, 2004).

One of the many reasons for engaging in risky sexual behaviour such as sex work was that women lacked control over decisions pertaining to financial constraints in the family (Abdelrahim, 2010). Deprivation of the poorest households exposed them to HIV high-risk behaviours, particularly labour migrants and sex workers whilst searching for better standards of living (Collins & Rau, 2000). Additionally, the poor can have difficulty in realising long-term risk management.

Studies find association between economic constraints and HIV abound. In a review of the literature of 45 qualitative and quantitative studies, we found that young women were engaging in sexual behaviours due to economic problems and income disadvantages (Luke, 2005). This kind of behaviour is widely common in Sub-Saharan Africa. These findings are consistent with a panel study conducted in South Africa among 4,752 young males and females whose ages were from 14 to 22 years old (Dinkelman et al., 2007). He found that low economic status, was associated with multiple partners and poverty rates were associated with unprotected sex.

These relationships were further highlighted by Booysen (2002) who investigated the relationship between risky sexual behaviour and low economic status with increased exposure to HIV by using data drawn from the South African Demographic Health Survey (1998) of 11,773 women asset-index. This study revealed that poor women were less likely to be knowledgeable about HIV/AIDS, which increased their susceptibility to HIV by highlighting how poverty prevents women from seeking health security and put more attention to how to secure food and basic needs to their families.

These studies confirm the relationship between poverty indicated by low economic status and HIV. Yet these studies lacked the comprehensive viewpoint of the problem, by not considering other factors such as socio, psychological factors associated with risk sexual behaviours. In line with the structuration theory, which explains the important of the place and environment in driving the human behaviours and using ethnographic methodologies in Zambia, Byron et al. (2007) found that frequent droughts, and limited wages and labour opportunities were major factors behind engagement of women in commercial sex. These studies not only support the relationship between economic problems and HIV, but also indicated the association between women's lack of knowledge and HIV.

2.3.1.3 Food Insufficiency and Vulnerability to HIV/AIDS

HIV/AIDS and food inadequacy were found to be the major causes of morbidity and mortality in Sub-Saharan Africa (Tsai et al., 2011). Strong biomedical evidence indicates that malnutrition and parasite infection heighten HIV transmission in addition to occurrence of opportunistic infections after HIV (Nattrass, 2004). Gillespie and Kadiyala (2005) found that food insufficiency and lack of nutrition speed up the spread of HIV supported this argument. Given that malnutrition is a function of poverty, these arguments strengthened the assumption that poverty facilitated and accelerate the prevalence of HIV in Sub-Saharan Africa (Nattrass, 2004).

Parasite infections especially malaria and intestinal parasites that are common in Africa, can weaken the nutritional status and lead to further worsening the immune system damaged by HIV. However, the situation is further aggravated by the inadequate healthcare which leading to lack of treatment for parasitic infections (Nattrass, 2004). Thus, poor sanitation and lack of healthcare due to poverty make poor people more vulnerable to HIV.

Poverty associated with poor nutritional status appears to play an essential role in the power of decision making in sexual relationships. Based on a survey of 1,255 adults, Weiser et al. (2007) have found that food insufficiency, inconsistent use of condoms, sex exchange and lack of control in sexual relationships increased the odds of unprotected sex. Poverty and food inadequacy are believed to increase sexual risk, mainly among women who may involve in transactional sex to secure food for themselves and their children and wards, as poor nutrition affects the quality of life and functional status.

Ngwenya and Mosepele (2007) analysed primary data among 248 subsistence anglers households in Delta (Uganda) reported that reduction in fish production resulted in increased poor nutritional status and severe food insufficiency that led to

HIV/AIDS related stressor through engaging in illegal sexual contacts. However, these studies ignored the importance of social vulnerability that can increase people's risky behaviours with limited condom use.

HIV/AIDS can be a cause of food insufficiency that weakened the immune system of PLHIV and raised the incidence of opportunistic infections (Weiser et al., 2012; Lee & Frongillo, 2001). The effective dependency ratio for affected persons from poor resource settings correlated with household food insufficiency (De Waal & Whiteside, 2003). Food inadequacy is a major and important issue in the context of providing care and support to PLHIV (Swaans et al., 2009). It is pertinent to state that a person on ART treatment can remain healthy and productive for a long period of time (10 years or more) if he/she has good nutrition (Tsai et al., 2011; Suttajit, 2007; Hughes et al., 2004).

Recently, ART was provided free of charge for PLHIV in Sudan, which may overcome the financial barrier to some extent. However, there are other forms of barriers such as weakness of capacity building of healthcare providers, limited weak care and treatment services, difficulties in retention and participation of PLHIV in care and treatment, low laboratories services to improve delivery and monitoring of ART and other HIV related diagnostics. In addition, the negative attitude of health workers towards PLHIV and barriers to scale up and integrate TB prevention and detection among HIV infected could be preventing treatment uptake.

2.3.1.4 Gender Inequality and Vulnerability to HIV/AIDS

More than half of the women in Sub-Saharan Africa contracted it from their husbands or partners (Falleiro & Noronha, 2012). The national prevalence surveys in South Africa alone found that most of the affected population were women, and 29.1 percent admitted to the public antenatal clinics in 2006 were HIV positive (Giulia et al.,

2009). According to the epidemiological projection done by the Sudan National AIDS Control Programme in 2009, approximately 100,000 women are likely to be infected by 2014 (SNAP, 2010).

A prevailing notion brought out the evidence that gender inequality had a significant influence on HIV transmission (Kemboi et al., 2011; Giulia et al., 2009). Several studies argued that women were disadvantaged from the biological point of view and male-to-female transmission of the virus was approximately two to four times likely to occur than female-to-male (Gillespie & Kadiyal, 2005; Gupta et al., 2003). Kemboi et al. (2011) supported this argument and indicated that biologically, women are more exposed to sexually transmitted diseases/infections including HIV than men, thereby retaining women at a higher risk of infection per sexual contact. Young girls are more susceptible to micro lesions, particularly when sex is forced because their reproductive systems are underdeveloped causing greater exposure to HIV (Edgardh, 2000; UNDP, 2004).

The concept of gender is essential to any discussion in understanding the relationship between HIV and poverty (Byron et al., 2007). Gender inequality, economic dependence of women, violence, and lack of education, unemployment and coerced sex cause greater exposure to HIV than voluntary sex (Rodrigo & Rajapakse, 2010). In many developing countries, women economically depend on male support. This is predicated upon the assumption that women's private possessions, including their sexuality have economic potential. Hence, women's economic and financial dependency on men increases their vulnerability to HIV (Masangala, 2007).

Moreover, according to the findings of the Integrated Bio-behavioural Survey conducted in Sudan in 2010, approximately 90 percent of the female sex workers reported that they enter sex work due to lack of financial resources (IBBS, 2013). Evidence produced by the study conducted in Khartoum State among female sex

workers found that approximately 86 percent reported financial constraints and needs as the reason for venturing into sex work (Abdelrahim, 2010)

The prevalence of HIV among high risk groups in Sudan was found to have wide range of variation (0% - 7.7%) for the FSWs, and (0.3% - 6.3%) for the MSM . The HIV prevalence among these groups indicates a concentrated HIV epidemic in FSW and MSM in Red Sea and Kassala (two States in the Eastern part of the country that border one another). Higher HIV prevalence in these two States could be most likely be explained by many factors, such as bordering high prevalence countries like Ethiopia and Eretria and free population movement across boarder. The level of sexual risk taking between the two groups was substantial, and reported injecting drug use was rare except in one of the central states (Abdelrahim, 2010).

In spite of a substantial exposure to HIV risks, the majority of the groups did not consider themselves at risk for HIV. This may be explained by insufficient information about HIV found among the groups. Regarding the consistent condom use, it is low compared to what found in a study carried out in Khartoum State in 2008 (35.9%). (Abdelrahim, 2010).

The number of transactional sex partners in Sudan per week ranged from two to five, which is similar to the study carried out in 2009 in Somalia, where the median number of partners was three (Elhadi, 2013). In a recent study in FSW in Greater Cairo in the neighbouring country of Egypt, 22.4 percent of FSW reported condom use at last sex with clients, similar to a study in Somalia where it was reported by 24.0% of women.

The overall condom use in FSW throughout the Middle East and North Africa region is similarly low. In Sudan, somewhat more than a quarter of FSW reported using condoms consistently in the past month only in three states. Such low reported condom use implies a need for urgent introduction of condom promotion programmes for FSW

and their clients. It also found that injecting drugs was infrequently reported, with the exception in the western zone (5.0%). Starting selling sex before the age of 18 was most commonly reported in the Western zone of Sudan (Elhadi, 2013).

Additionally, in spite of substantial exposure to HIV, the majority of women do not consider themselves at risk of HIV. Ever testing for HIV was low and the highest rates were found in the eastern zone (22.0% and 23.9%). This may be explained by insufficient information and the consequent low awareness of HIV. Currently, there are 123 voluntary counselling and testing sites in Sudan, which are located mainly in urban areas. Overall, in 2012, 86 299 individuals were tested for HIV; 3% of these were found to be HIV-positive (Elhadi, 2013). Higher levels of HIV prevalence are found among vulnerable populations such as prisoners, truck drivers, Internally Displaced Persons (IDPs) and refugees in North Sudan.

According to structuration theory, under certain conditions an individual may be forced to achieve something that is not originally there through his/her agency. For example, patriarchal relationships where men control the decision-making on sexual relations possibly leads to unprotected sex. Evidence points to significant positive associations between larger age variances among partners, due to economic transactions which results in unprotected sexual behaviours (Luke, 2005). Poverty is the leading cause that forces many girls to accept relationships with older men who are capable and prepared to give money, goods or different kinds of financial support in return for sex. Coercion by older men and men having multiple concurrent sexual relationships pull young women to a massive and huge network of infections (Kemboi et al., 2011). The unequal power relations reflected in such relationships affect adolescent girls' ability to refuse insecure sex, and expose them to sexually transmitted infections, including HIV/AIDS.

Gender inequality and poverty deprives women of their ability to satisfy their socially designated responsibilities, which may push them into commercial sex work (Kamanzi, 2008). The poor, especially women, were exposed to sexual imposition since HIV prevalence is partly a function of deprivation (Shelton et al., 2005). These studies did not highlight the traditional, political and religious factors, which are beyond the economic and social factors that constrain the use of condoms. Women suffer from inequalities both in gender and in income and assets. Thus, inequalities can leave women prone to HIV, particularly in rural households (Tobias, 2001).

2.3.1.5. Poverty, High-Risk Sexual Behaviours and Vulnerability to HIV/AIDS

An individual may decide to engage in risky activity where there is lack of information about the risks or where the individual is incapable to accurately evaluate the level of risk. In the absence of this information, the individual might still choose a risky type of job if the compensating wage differential exceeds the expected costs (Gertler et al., 2005).

In some circumstances, men engage in unprotected sexual intercourse, to build self-confidence, which occur constantly among people's social interactions (Fernandez Davila, 2009). This is a critical role in influencing sexual behaviours. Furthermore, many people still make wrong and irrational choices, due to the power of social interactions although they have a high level of knowledge concerning risky sexual contact (Moore & Opping, 2007). This view was argued by a study conducted among 400 people in Northern Kenya, which indicated that self-assessment might not prevent exposure to HIV risk behaviour (Roth et al., 2006). These findings indicate that knowledge does not translate to behavioural changes due to the aforementioned social and economic factors.

The transmission of HIV is widespread through unprotected sexual contacts including unused of condoms (Moore & Opping 2007). In many communities, including Sudan, condom use is associated with sex work (Roth et al., 2006). The Knowledge, Attitude and Practices (KAP) Survey conducted in Sudan in 2010 by Elnumeri (2010) among 3,442 university students, out of which 1,801 were females, found that the use of condoms was very low. Due to socio-cultural unacceptability, 83 percent of the students never used condoms and only 0.1 percent of the females used them.

An observed phenomenon emerging from cultural and traditional beliefs is female genital mutilation practices (FGM) linked to risk of HIV. It can lead to the transmission of HIV due to unsterilized cutting instrument (often razor blade) impacting poor health of women through haemorrhages requiring blood transfusion and vaginal tearing from violent sex contact (Wadesango et al., 2011). In Sudan, genital mutilation is practiced among 89.5 percent of women in the urban areas and 91.3 percent in the rural areas (UNHCR, 2001) which exposes them to HIV due to the use of contaminated cutting equipment.

On the other hand, the increasing urbanisation and travel by men outside the country away from their families, to places of high HIV risk tend to expose them to risk of sex behaviour through drug abuse and homosexuality (Padilla et al., 2008). When returning home, may transmit the virus to their wives, causing the issue of risk of HIV transmission within marriage.

2.4 Review of the Impact of HIV/AIDS on Poverty

HIV/AIDS increases poverty and deprivation. Moreover, it combines to form a vicious circle of poverty and HIV/AIDS in which affected families are further impoverished (Price-Smith, 2008). The household income declines when adult

members of the household become ill and lose their jobs. The disease affects those mostly from the productive and reproductive age group, upon whom the governance and development of the community within the country at large depends. The fact that HIV/AIDS mostly affect individuals who are in their productive working ages poses multiple challenges to development (Pennap et al., 2011).

A skilled and trained work force also reduces leading to a negative impact on economic growth. Increased morbidity and mortality due to HIV and AIDS result in an increased number of dependent people within the affected society. In Sudan, an estimated 30,000 children are orphaned by AIDS and this is expected to increase to 60,000 by 2015 (UNAIDS, 2011). Thus, the following sections discuss critically how the previous studies explain the direct and indirect socio-economic impact of HIV on poverty, at macro and micro level. For effective analyse of the relationship between poverty and HIV, there is a need to review previous studies to investigate the effect of HIV/AIDS that may push the poor to extreme poverty.

2.4.1 Direct and Indirect Impact of the Epidemic

Severe economic impact of HIV/AIDS manifests at both the micro (individuals/households) and macro levels (sectors and national levels) (Mubyazi1 et al., 2012). In the early stage of the epidemic, the impact at the macro level was more difficult to predict and measure. Russell (2004) argued that the greatest socio-economic impact of HIV is felt at the micro level. Thus, Sudan is considered as a low HIV prevalence country (less than 1%). The present study focuses on the impact at the individual and household levels, whilst, to a lesser extent, also examines the impact at macro levels.

The economic effects are observed through direct and indirect costs. Its direct cost includes hospitalization, physicians' visits and prescription medications. This includes medical care costs such as costs of antiretroviral treatment and cost for the treatment of opportunistic infections. The indirect cost includes costs that cannot be covered by the government and insurer and are burdened by the patients, family members and friends, such as informal care, support services, housing subsidies and disability benefits (Mubyazi et al., 2012). These are further compounded by huge loss of income resulting from loss of jobs and decline in productivity as a result of continuous sickness and incapacity to work beside costs of funerals (Rodrigo & Rajapakse, 2010).

The epidemic leads to an aggravated poverty, constrains human development efforts and achievements, and negatively affects gender equalities. These place serious extra burden on the government to maintain essential services, reducing labour productivity and supply, and constraining economic growth. For instance, in 2002, factor productivity growth in Lesotho drops by up to 23 percent and for South Africa factor productivity growth falls by up to 15 percent. In addition, it was estimated that in 2010, the annual aggregate GDP in South Africa, would be 17 percent lesser in the occurrence of AIDS in 2010 (Alemu, Roe, Terry & Smith, 2005).

2.4.2 Economic Impacts of HIV/AIDS at Micro and Macro Levels

AIDS has had its most visible impact on the economies of African countries but this is difficult to measure. According to the Centre for Strategic and International Studies (CSIS), (2002), the economies of the countries with highest HIV prevalence rates were already struggling with development challenges, excessive debt burden and

high reduction in trade. The epidemic combined with these factors creating additional burden to further aggravates the situation.

This section reviews in detail the previous literature on the economic impact of HIV epidemic at the both micro and macro levels. The first section discusses the economic impact at the micro level and the second section demonstrates the economic impact at the macro level.

2.4.2.1. Economic Impacts of HIV/AIDS at Micro Level

The demographic impact of HIV/AIDS between human population structure and growth has had significant negative impacts in South Africa (Blacker, 2004; Dorrington et al., 2004; Feeney, 2001; Barnett et al., 2001).

2.4.2.1.1. Loss of Household Income and Savings

HIV/AIDS has had severe effect on households through direct costs of medical care and the cost of productive time reallocated to care as well as loss of jobs and income due to increasing mortality rates (Yamano & Jayne, 2004). A study conducted among 1,481 affected and non-affected households in Nigeria found significant losses to households and government in terms of income and direct medical care costs respectively (Mahal et al., 2008). Further, the study confirmed a considerable burden on the household care and huge dependence on government assistance.

According to the livelihood theory, people rely on their assets to face risk and uncertainty, and poor people are more suffer with AIDS burden. Steinberg et al. (2002) conducted a survey among 771 affected households and reported that the impact was widely observed with decreased savings and loss of assets. The burden is the largest among affected persons in South Africa, who were more likely to suffer from loss of

employment due to poor health and social stigma. Thus, they are more likely to become poorer than non-affected persons (Federica, 2004).

With HIV/AIDS, households are forced to use their savings, increase borrowings and/or engulfed in debt crisis (Masanjala, 2007). A study by the Canadian AIDS Society (2004) supported these arguments. As explained by the livelihood theory, the major coping strategies faced by PLHIV include increased borrowings, sale of assets and draw on savings to cope with the out-of-pocket spending (Rodrigo & Rajapakse, 2010). Booyesen et al. (2002) found that 60 percent of the AIDS affected households constituted the majority of the sick household members who utilised healthcare services and were significantly more likely to have caregivers than those from unaffected households (37%) which indicates additional financial burden among affected households. The impact was widely observed among households with PLHIV in Vietnam, which led to decreases in consumption expenditures of between 37 percent and 48 percent (Ha Noi, 2005).

In 2006, the Kenya National AIDS Control Council examined the expenditure patterns among affected and non-affected households. It found that the affected households spent much more on average on healthcare and funeral costs than unaffected households due to increased morbidity and mortality. The Council extended the analysis to examine the invisible costs. This was done by giving a monetary value to the opportunity costs of all the productive time lost due to hospital stays and seeking treatment for the HIV/AIDS infected family members and their caregivers. In addition, the results indicated a high percentage of households selling their assets to cope with the burden of the disease. These findings support a study of Balyamujura et al. (2000) using a case study in Zambia, which indicated that HIV/AIDS caused a decline in income and increased the caregiver's costs.

A study conducted in South Africa found that affected households were much poorer compared with non-affected households, with lower monthly incomes (mean US\$ 130 versus US\$ 215) and expenditures (US\$ 90 versus US\$ 119) and lower numbers of employed members (11% versus 20%) (Bachmann M., & Booysen, F., 2004). The conditions of poverty were most severe among affected households, particularly among those who experienced high mortality and morbidity rates (Oni et al., 2002).

The poorer older aged parents suffer from reduction in financial resources due to their adult children's illness and death from HIV/ AIDS. Those in better financial positions may utilise their savings or sell their assets or may engage in various sorts of debts or worse still, depend on their grandchildren. A survey in Thailand conducted among parents of 394 adult children who died of AIDS, supports this view and found that 82 percent of the parents paid all the medical care costs during their children's period of sickness (Knodel & Im-em, 2004). Thus the present study, attempts to examine the impact of the AIDS on the household's income and savings in Sudan.

2.4.2.1.2. Impact on Education

One of the biggest setbacks on children whose parents suffer from illness and death due to HIV/AIDS is loss of educational achievements. In addition, increased healthcare expenditures will further decrease commitments to other family expenditures, this situation often force children to leave school and join the job market (Okyere et al., 2010).

HIV/AIDS affects both the supply and demand for education. On the supply side, an increasing numbers of teacher are succumbing to HIV/AIDS, placing fiscal burdens on the education system and increasing the ratio of students to teachers (Hamoudi & Birdsall, 2002). In the Central African Republic, 85 percent of teachers'

deaths and 70 percent in Cote d'Ivoire were due to HIV/AIDS. The deaths often occur while the teachers are in their active youthful lives (ILO, 2004). It also reported that the costs in Swaziland of bringing in new teachers to compensate for those that have been lost to AIDS are estimated to reach US\$ 233 million by 2016 (UNAIDS & WHO, 2000).

On the demand side, HIV/AIDS-related costs reduce the amount of money available for households to pay for school-related costs, indicating that children in HIV/AIDS affected households may be forced out of school (Akwaru, A.P., et al., 2003). Furthermore, a shorter life expectancy reduces the lifetime of children returning to education, leading to a reduction in school attendance. HIV/AIDS affected households in South Africa and reduced their spending on education by 7.3 percent despite the heart gladdening fact that South Africa provides free primary schooling. This ensures the enrolment rates for children increase marginally (Oni et al., 2002). This finding was supported by further study that found that school attendance was negatively correlated with HIV/AIDS prevalence (Yamano & Jayne, 2005).

Parents, who per chance transmitted the virus to their children, suffer from reduction in productivity and reduction in investment in their children coupled with increases in healthcare expenditure and psychological trauma (Vasilakis, 2012).

2.4.2.2. Economic Impacts of HIV/AIDS at the Macro level

In the absence of widespread use of ART, HIV/AIDS will reduce life expectancy eventually leading to a considerable decline in economic productivity at the national level. Depleting the quality and quantity of the country's human capital is one of the major consequences of the epidemic (Abegunde & Stanciole, 2006). This may lead to massive reduction in GDP and Gross National Income (GNI) output. Wyss et al. (2004) attempted to ascribe a value to the household level's economic costs of

HIV/AIDS described above and argued that most households in Chad suffered a great impact from the HIV/AIDS epidemic. The costs assigned to the epidemic during the period of illness up to death indicated more than four times the annual GNP per head. Productivity losses made up 28 percent of the total costs, 56 percent of the costs related to healthcare expenditures, while the rest (16%) to funeral expenses. Evidence illustrated from previous studies indicated that the main channels through which HIV/AIDS impact severely on countries include national labour force, health services, and income and savings.

2.4.2.2.1 Impact on National Labour Force

In the years before the advent of effective antiretroviral therapy, a large proportion of HIV positive workforces, both trained and unskilled, died in their most creative and productive years, thus decreasing productivity. HIV/AIDS affects the economy by increasing the health risks of workers, especially those who are able to work. Productivity will decline due to increased morbidity and mortality rates leading to decrease in national revenue. It also affects productivity by low investments in technologies and enhancing the skills of health workers on HIV (Coulibaly, 2003).

A study on the macro impacts of HIV/AIDS asserted that the number of working people would continue to grow, but at a slower rate than it would have been without HIV/AIDS. It caused severe problems in countries with high prevalence rates in terms of labour force efficiency (Coulibaly, 2003). In Ethiopia, 93.5 percent of HIV/AIDS patients made less than 499 birr per month (US\$ 64.18). A study by Perkins (2005) supported this argument, which stated that not only does the disease hit the productive members of the labour force, but it also prohibits the transfer of knowledge from adult to younger generations. Hence, they end up growing without the basic and important traditional lessons such as farming techniques that may help them to survive.

HIV/AIDS will shape the evolution of human development and cause huge damage on economic growth, which in turn makes the crisis a herculean task to tackle by less developing countries (Philip & Rayhan, 2004). Due to loss of productive workers, strategic sectors of the economy such as agriculture, mining and other productive sectors will come under pressure, which will result in severe reduction in export earnings (Dixon et al., 2002). Consequently, the balance of payment will come under pressure with potential shortage in government budgets, increases debts and its harsh consequences.

Increased morbidity and mortality among government employees add substantial direct and indirect costs to the government. Like private sector companies, the government needs to increase its contributions to pension and life assurance, disability and medical benefits of its employees due to the HIV/AIDS epidemic (UNDP, 2006).

2.4.2.2.2 Impact on Health Services

Evidence from previous studies show that the healthcare costs are the most visible of the direct costs of the epidemic (Go, 2002; Stillwagon, 2000). PLHIV use both public and private healthcare services, but their utilisation of public services are approximately higher, because they experience long-term sickness and seek various treatments for their HIV infection and the costs could be exorbitant (Kumarasamy et al., 2007). Treatment and diagnosis cost for HIV/AIDS are the most challenging experience of infected persons, particularly amongst the poor leading to delays in accessing healthcare (Mwambete & Justin, 2011).

The high rate of demand for treatment of opportunistic infections leads to a pressure on hospital spaces (bed occupancy rate being high) and create severe burden on hospital services. In countries with high HIV/AIDS incidence, hospitals face huge

pressure with reduction in their capacity by approximately 50 percent (Coulibaly, 2003). Households from poor resource settings lacked the financial resources to obtain medical care from health centres and sufficient nutrition to assist infected family members (Mwambete & Justin, 2011).

HIV/AIDS increases healthcare spending in many countries. A study in South Africa showed that the government's annual per capita healthcare spending from 1997 to 2010 increased by 6.9 percent (Arndt & Lewis 2000). These findings show that not only are poor households burdened financially due to HIV/AIDS, but also severe burden with healthcare services.

It is pertinent to note that HIV/AIDS also affects the supply of healthcare providers. In several countries, large numbers of healthcare specialists are being infected by the epidemic. Botswana faced huge losses in healthcare providers due to HIV/AIDS where approximately 17 percent died from HIV between 1999 and 2005 (UNAIDS, 2006). Similar findings were reported in Zambia showing 40 percent of nurses and 30 percent of doctors were infected by the virus (Whiteside, 2002).

As the number of HIV/AIDS patients rise, there is a need to expand the already existing healthcare facilities (Barnett et al., 2000). The impact was also observed on healthcare personnel levels with the need to provide overtime work and additional care and support (Veenstra & Whiteside 2005). In most African countries, healthcare workers are few while the prerequisite formal training and equipment are also lacking. A heavy workload coupled with poor conditions of service, and its attendant emigration to seek greener pastures in richer countries, are factors that have played a key role in this shortage. There is also no sign that these will improve in the near future.

2.4.3 Social Impacts of HIV/AIDS: Stigma and Discrimination

In estimating the socio-economic impact of HIV/AIDS on households and individuals, it is important to discuss the stigma and discrimination as a significant impact on the households of the infected individuals. A study in urban Botswana found that families with members suffering from HIV/AIDs faced considerable stigma and discrimination and experienced fear in terms of rejection by the community (Letamo, G. 2003). These factors have been known to reduce the overall quality of life. In Sudan, testing positive for HIV/AIDS is considered a death sentence. Mindful of the reaction of their neighbours and community members, older parents of HIV/AIDS victims are sometimes too frightened to disclose that their children are sick or died due to HIV/AIDS (SNAP, 2010).

Stigma and discrimination associated with HIV/AIDS have severely influenced PLHIV and their families (Mathur, 2013). Women were rejected by their families because of positive HIV status, while those widowed to AIDS face the risk of losing all claims to family assets and faced the burdens of blame and shame. This makes their situation in the patriarchal society worse than that of their male counterparts (Doyal, & Anderson, 2005). PLHIV faces considerable stigma and discrimination, mainly in the workplace. Access to healthcare and treatment services is perceived as a major obstacle hindering their efforts for treatment of primary and secondary infections (Holzemer & Uys, 2004).

2. 5 Conceptual Framework: Relationship between Poverty, HIV/AIDS and Livelihood:

The theories reviewed and illustrated, implied that the study of HIV/AIDS required multiple approaches, incorporating economical, geographical, social and

cultural considerations on the local and global scale. The conceptual framework for this research is based on these approaches presented in Figure 2.2 below. It shows the impact of poverty on HIV/AIDS and the impact of HIV/AIDs on household livelihood and socio-economic capital. Attempts have been made to demonstrate that HIV/AIDS is not only a biomedical predicament but a development problem as well.

This study investigates the relationship between poverty and HIV/AIDS using the livelihood framework. Livelihood income is considered in the same bracket as social institutions, gender relations and property rights (Carney, 1998). To sustain a certain standard of living it is necessary to obtain supportive livelihood assets. The livelihood outcomes of the households depend on the interaction of the following interrelated dimensions:

- (a) The livelihood assets, if a household has the required assets, it can build-up diverse capacities to face any risk and uncertainty;
- (b) The vulnerability context deals with risks, exposure and destruction of livelihood due to economic and environmental factors beyond the household's control;
- (c) The livelihood strategies; and
- (d) The transforming structures and processes.

The challenges are to strive to understand the precise mechanism that relates poverty and its associated factors to HIV/AIDS risks. Drawing upon several studies, this research applies the livelihood framework to study the vulnerabilities to HIV/AIDS risks (Masanjala, 2007; Loevinsohn & Gillespie, 2003; Seeley, 2002; Stokes, 2003; Tladi, 2006). Thereafter, it extends the analysis to the socio-economic factors that expose people to the transmission of HIV/AIDS. It also studies the PLHIV strategies by transforming processes to cope with the impact of HIV/AIDS.

The framework assumes that social and economic factors are important determinants in the spread of HIV/AIDS when building the livelihood framework. It

shows the dependent variable (HIV) and independent variables (Poverty and its associated factors), which are used in testing the hypotheses formulated in this research (See figure 3.1). Each link represented by bold arrows, starts from the key independent variable of poverty through its mediating factors of low economic status, low level of education and gender inequality to the dependent variable of HIV/AIDS risk. These links examine whether poverty makes people in Sudan directly vulnerable to HIV/AIDS or through its mediating factors.

Figure 2.2 shows the hypothetical relationships between the variables. Each of the variables constitutes a ‘latent’ construct. The three factors (economic status, education and gender inequality) act as mediating factors between the relationship and between the independent (Poverty) and dependent (HIV) latent constructs (unobserved variables as shown in the figure. Each latent construct is measured by a set of indicators (indicated by the small boxes that pointed out from each construct).

The arrows indicate the projected causal relationship. Several studies indicated that poverty is often associated with sex work, inaccessibility to healthcare, and limited power in negotiating sensitive sex issues (Masangala, 2007; Doyal & Anderson, 2005; Dowsett, 2003; Gillespie & Kadiyal, 2005). The wealth index, wealth score and wealth weights measure the construct of poverty. The index represents an internally coherent, robust and comparable measure of poverty based on assets and services. In addition, it performs better than the consumption expenditure index in explaining the differences in educational attainment and school attendances (Filmer & Pritchett, 2001).

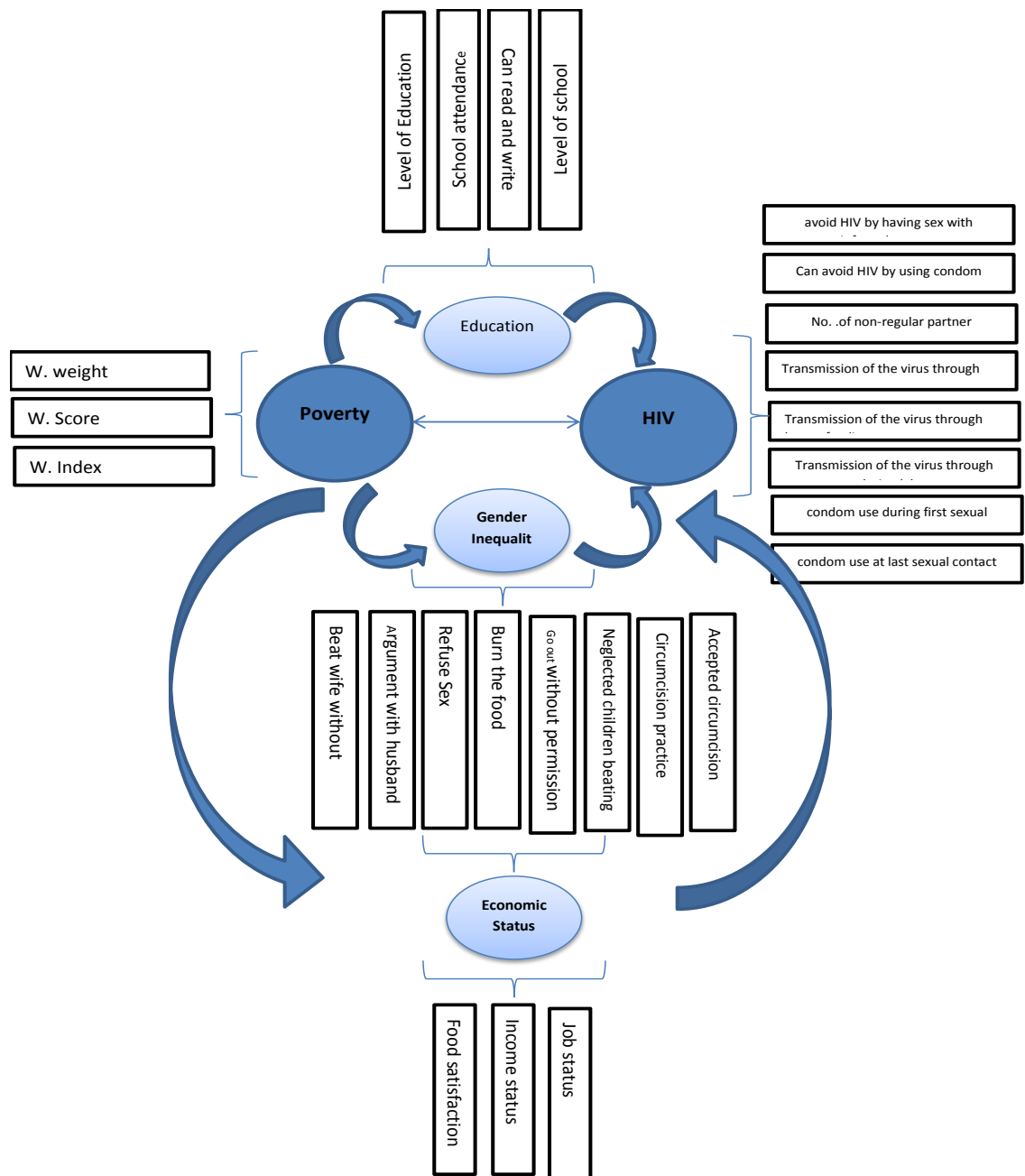


Figure 2.2: The Conceptual Framework: Relationship between poverty, HIV/AIDS and Livelihood:

The economic status construct was measured by employment status, satisfaction with job, income and food sufficiently also includes monetary power to purchase condoms, which according to the literature is the most effective method of preventing HIV/AIDS (UNAIDS, 2009; Holmes et al., 2004). Education was measured by school enrolment, the ability to read and write, level of education, and the highest grade completed at that level.

Gender inequality variables comprise different variables such as attitude towards domestic violence, female genital mutilation (FGM), polygamy and sexual negotiations. Several studies reported that poverty increases women's vulnerability to HIV risk. The risk and transmission of HIV/AIDS was measured at the knowledge base and sexual behavioural levels. These two levels formed the composite index of the different variables, which are discussed in detail in the analysis and findings chapters. The framework also examined the impact of HIV/AIDS on poverty and illustrated changes in socio-economic structure or performance and livelihood strategies. The conceptual framework underlining the following hypotheses resulted from the literature explored in chapter 2 has been tested in this study.

Hypothesis: (1) There is significant relationship between low economic status and high-risk HIV

According to the literature reviewed (Gillespie et al., 2007; (Dinkelman et al., 2007; Lopman et al., 2007; Greener & Sarkar , 2010; Fox, 2010; Abdelrahim, 2010), poverty indicated by the independent variable of low economic status increases the probabilities of vulnerabilities of the dependent variable of HIV. This means that HIV is expected to be positively associated with low economic status and negatively associated with wealth.

Hypothesis: (2) There is significant relationship between lack of education and high-risk HIV.

The dependent variable in this relationship is the education, which explains the level of HIV/AIDS knowledge and rationale sexual behaviour possessed by the individual. It is expected to be positively associated with the independent variable of education. It may be necessary to control the differences in the demographic variables of the individual, in particular household wealth, when considering this link.

Hypothesis: (3) There is significant relationship between gender inequality and high-risk HIV.

This hypothesis suggests that there is a significant relationship between gender inequality and HIV. In an African traditional setting, Sudan being no exception, inequalities are high between men and women. As a result, women are socially and economically disadvantaged and have limited access to social security and formal employment. The test of the hypothesis was captured both men and women gender responses to HIV.

Hypothesis: (4) Women are less capable to deal with HIV/AIDS coping strategies than men.

This hypothesis tests the impact of HIV/AIDS on poverty. The literature review argues that the HIV/AIDS is expected to lead to a significant reduction in wealth and an increase in the probability of poverty through the depletion of savings and resources, due to the high costs of treatment and hospitalisation, as well as stigma and unemployment (Rodrtgo & Rajapakse, 2010). Therefore, the HIV/AIDS epidemic undermines the household's capacity to survive by stripping off its livelihood assets. Consequently, the household is thrust into impoverishment with lesser returns and a

higher probability of its livelihood worsening (Mahal et al., 2008). Women are more vulnerable not only to HIV/AIDS but also to the economic impact of HIV/AIDS (Mbirimtengerenji, 2007). In addition, UNICEF, (2008) stated that Women often experience the impact of HIV more severely than men. Thus, this study suggests that the disease creates an extra burden on women rather than on men.

2.6 Summary

The review of relevant literature draw upon three major theories that describe human behaviours in relation to poverty and prevalence of HIV, namely the livelihood theory (Carney, 1998), drive theory (Tladi, 2006) and Giddens's structuration theory (Long, N. 2001). These theories explain human behaviours and exposure to shocks and how low economic status, low educational level, gender inequality are associated with HIV/AIDS. They also explain the extent of the impact of the disease on PLHIV and their families.

The chapter reviews in detail the literature on the relationship between poverty and HIV/AIDS. Most studies show robust findings on socio-economic factors that increase the spread of HIV epidemic in Less Developed Countries (LDCs) (Luke, 2005; Collins & Rau, 2000; Booysen & Bachmann, 2002; Wojcicki, 2005). These factors include lack of education, food insufficiency and socio-cultural factors such as lack of condom use, lack of negotiation sex among women and FGM practices. Several studies in African countries found that many women in developing countries engage in sex work for economic reasons that may expose them to HIV risk (Mbirimtengerenji, 2007; Natrass, 2004; Dixon-Fyle & Mulanga, 2004). Previous studies in Sudan support this argument (Abdelrahim, 2010; IBBS, 2010).

Access to education was found to be protective against HIV risk. The interaction effects between education and wealth can be significant when people have resources, and the capability to use these resources to safeguard their sexual health (Hargreaves et al., 2007; Glynn et al., 2004; Gregson et al., 2001). Sustained efforts to ensure better educational levels as well as targeted and tailored messages on HIV prevention efforts can yield positive results. In addition, lack of condom use as a protective method against HIV risk is high among low educated and economically poor people (Moore & Opping, 2007).

Several previous studies from many African countries affected by HIV/AIDS have provided a link between health and economic development. Health is the most valuable asset for poor people and it is considered the most essential factor for emergence from poverty (Ha Noi, 2005; Greener & Sarkar, 2010). Hence, ill health a serious factor pushes people into poverty. This applies to the HIV epidemic, which has the potential of driving HIV/AIDS infected families into poverty and its consequent multi-sectorial development challenges with double emphasis.

According to the literature reviewed, and the theories discussed, this study underlines the framework that reflects the four hypotheses extracted from the literature explored in chapter 2. The first three hypotheses examined the impact of poverty on HIV/AIDS and the forth hypothesis assesses the impacts of HIV/AIDS on poverty

The challenge is to try to understand the precise mechanism that associates poverty with HIV risks. Most of the reviewed studies have found a strong association between poverty and HIV, but have failed to identify a strong causal relationship. More studies of this nature are needed to inform policy makers and health officials on how poverty exacerbates HIV risk. In addition, the majority of the reviewed studies concentrated on high HIV infected countries. This study has tasked itself to address

such a gap to contribute to literature and identify policy implications for health planners and public authorities to control the prevalence and impact of HIV/AIDS in Sudan.

The reviewed studies concentrate on generalised epidemic countries. This study partially addresses the significant bias towards the several studies that exist in the current literature, in countries and regions with high HIV prevalence and not be more attention for those with concentrated epidemic like Sudan. All empirical studies conducted in heavily HIV affected countries, S. Africa, Botswana, Uganda, Kenya, Zambia, and Cameroon. This study attempts to fill this gap by investigating the relationship between poverty and HIV in a low HIV prevalence country like Sudan.

The literature was somewhat biased toward paying less attention to the ways in which pre-existing health and nutritional status may have compromised the immune status of individuals. This study attempts to investigate link by identifying how food insufficiency may exposed people in Sudan to HIV risk. The most important protective method discussed in these studies was condom use, and in many countries including Sudan, this method is rejected at religious and cultural levels. This study attempts to address this issue and provide empirical evidence on this matter. In addition, it discuss the coping strategies among infected people from the gender perspective.

CHAPTER 3

Methodology

3.1 Introduction

This study examines people's susceptibility to HIV/AIDS risks as a result of low economic status, gender inequality and low level of education. In addition, the study explores the coping strategies among PLHIV to deal with the impact of the disease. The reviewed literature supports both the quantitative and qualitative aspects of the relationship between poverty and HIV (Whiteside & Sunter, 2000; Wojcicki, 2005; Surat et al., 2007; Greener et al., 2007). There is a bi-directional relationship between these two problems. Poverty alone cannot be used to explain the HIV/AIDS epidemic or vice-versa (Scott & Simon, 2011).

This chapter gives a detailed account of the manner in which the study is conducted. Further, important methodological issues of validity, reliability and ethical considerations are discussed. This chapter consists of four main sections. Section 3.1 provides a brief introduction on the key areas of the study. Section 3.2 discusses the research design and provides details on the approaches used to conduct this study. Section 3.3 discusses the data illustrates the data collections methods and sampling procedure. Section 3.4 provides a brief summary.

3.2. Research Design

Methodology was defined as a systematic procedure, plan and strategy linking methods to reach the desired goals. It reflects the researcher's view of actions and organisation, which must be understood (Crotty, 1998). The approach is very important because interpretive research assumes that people in society create and associate their

own subjective meanings. The research design shows the structure of the research and its relation to each part of the topics.

Empirical evidence is essential to establish the relative importance of the relationship between poverty and HIV/AIDS. The nature of the study necessitated a combination of qualitative and quantitative methods of data collection and analysis to gain deeper understanding of the phenomena under the study. This is a mixed method utilising a cross sectional study using secondary data and Focus Group Discussions to further explain the quantitative findings owing to the fact that poverty is much broader than income. For instance, a crucial part of HIV/AIDS risks and responses is the understanding of people's 'connectedness', or social capital. Aligning with recommendation by Creswell (2013), this study used a mixed methods approach as multiple methods provide a better understanding of research problems as they complement each other. The mixed methods approach addresses some of the limitations and conclusions derived from the data collected through self-reporting. The rationale for using the mixed methods approach is that the combination of the quantitative and qualitative methods facilitates a complete procedure analysis (Green & Graham, 1989; Tashakkori & Teddlie, 1998).

3.2.1 Research Approach

The study is a mix method research in nature using qualitative and quantitative approaches to develop a satisfactory research paradigm for analysis and consequently benefiting from the data collected. Due to the complex nature of this research, to gain an in-depth understanding of the phenomenon under study, a combination of the qualitative and quantitative methods of data collection and analysis was required (Scrimshaw, 1990; Niehof, 1999). The mixed methods approach is an alternative research approach that complements the traditional research techniques. Creswell

(2013) argued that the collection of different types of data would be more representative in studies where the research problem describes the behaviours and trends, explains the meanings and explores the outcomes in both narrative and numerical formats. In this regards, the mixed methods approach is defined as methods and design for a comprehensive single study (Johnson & Onwuegbuzie, 2004).

3.2.1.1 Quantitative Approach

Quantitative research was explained by the phenomena of collecting numerical data and using statistical methods for analysis (Aliaga & Gunderson, 2002). An important characteristic of the quantitative method is that it is specifically suited for testing hypotheses that empirically support the research findings. The method also generalises results from large population samples to quantify attitudes, opinion and behaviours. Though this study explores use of quantitative approach (PLHIV and SHHS surveys) in its analysis, qualitative approach (FGDs) is also employed to complement the findings of the survey data to broaden the findings in line with Luke and Philip (2009). The research is not ignorant of the fact that misuse of the sampling method can affect the accuracy and validity of the results.

Creswell (2012) defines the quantitative research method as an investigation based on testing a theory, which is composed of variables measured numerically and analysed using statistical techniques in order to examine whether the predictive generalisation of the theory is reality. When compared with qualitative methods, the weakness of quantitative methods lies on the failure to elicit underlying meanings and motivations.

This study selected a cross-sectional research as its quantitative approach. A survey was conducted with the use of questionnaires that was widely applicable. A face-to-face interview was conducted as a conversational encounter between an

interviewer and the respondent with the ultimate objective of acquiring information on HIV/AIDS survival among PLHIV in line with (Silverman, 2013). The statistical analysis used for the study aimed at investigating the relationships between the dependent variables and the predictor variables to examine the impact and the coping strategies among PLHIV. In addition, we employed data from the Sudan Household Health Survey to analyse the vulnerabilities to HIV risk.

3.2.1.2 Qualitative Approach

Qualitative methodologies explore feelings, thoughts and knowledge of others through various means. In order to gain a deeper understanding of the processes shaping the social world, these methodologies also delve into the complexities of daily life (Lim & Dwyer, 2001). This means engaging in in-depth studies of the lives and experiences of others. Thus, this study attempts to reveal how PLHIV within a society understand their own circumstances, problems, behaviours and the reasons governing such behaviours and priorities. The qualitative approach includes in-depth and open-ended interviews, direct observations and documentation. The sample size for a qualitative research is small, and participants are selected to fulfil a given criteria (Creswell, 2012). The qualitative method in this study assist in projecting a comprehensive and complex picture through analysing words, reporting observations and detailing views and opinions of the participants. FGDs among PLHIV were conducted to examine the relationships between coping strategies, processes and the inter-generational transmission of poverty for families affected by HIV/AIDS.

3.3 Data Collection Method

The present study used a mixed methods approach consisting of three main parts. In the first part, the quantitative method is used to describe the socio-economic, demographic and social network information of the respondents. The primary survey was conducted to collect numeric data, obtained from PLHIV at the VCT/ART centres and the associations to study the impacts and coping strategies. This data was subjected to the chi-square and discriminant function analysis. The second part sourced data from the 2010 Sudan Household Health Survey, where the data examined patterns of behaviour and type of life among people in Sudan in the context of poverty and vulnerability to HIV/AIDS risk. The Structural Equation Modelling method (SEM) and Chi square were used for analysis.

The qualitative method is utilised to obtain information on actual behaviours and to interpret its meaning to gain insight into people's experiences and to draw information that people were unwilling to disclose in a survey. By conducting focus group discussions, the last part attempted to explain how PLHIV are coping with the consequences of the disease. To supplement the quantitative data, factors that exposed people to HIV, were identified. The survey instruments are included in Appendix (A). In the final analysis, the quantitative and qualitative findings were linked, discrepancies noted and reasons given. The data collection method is described in detail below.

3.3.1 The Primary Survey

This study seeks to identify the conditions in households affected by HIV/AIDS, which may push them deeper into poverty. Dorrington et al. (2001) asserted that HIV/AIDS is reaching a stage where morbidity and mortality rates were increasing rapidly. In the struggle for survival, this situation places additional pressure on households. Poor households are often the worst-off and vulnerable to the long-term

effects of HIV/AIDS and poverty. Thus, the primary survey was conducted to examine the coping strategies among PLHIV.

3.3.1.1 Design of the Questionnaire for Conducting the Survey

A questionnaire was designed to meet the research objectives and used to test specific hypotheses that were drawn from the literature in chapter 2. The data was collected using face-to-face interview. The study used self-administered questionnaires. The advantages of self-administered questionnaires are that they reach large numbers of people, are cost effective, easier to collect data for analysis and relates directly to the study questions.

The questionnaire was developed with reference to relevant previous studies and in consultation with the supervisor and members of the ethical approval committee. It was drafted in English and translated into Arabic to ease communication with respondents, as most of the respondents are Arab speakers. Prior to the interview, consent was obtained verbally from all respondents separately. In order to protect the privacy and confidentiality of information of the respondents in the survey their names were not recorded. Thus, the respondents had choice to answer the questions without being subjected to pressure or community norms or expectations.

To generate effective questions, both open- and close-ended questions were used following the recommendations made by Hatch (2002). The questions required personal responses from the respondents. The questionnaire was divided into various sections. The First section displayed the socio-economic and demographic information such as age, sex, religion, education and occupation. The demographic and background information was essential so that it could be used as moderate variables to describe and profile the study populations.

The second section covers children's background, which shows data such as number of children, schooling status of children and educational costs. The purpose of this section was to determine the extent of burden of the disease between a household with children and without children. The information will assist in estimating the amount of additional income required for food, children's schooling, health and any other needs (Cameron, 2007).

The third section covered the wealth and financial backgrounds of the respondents such as savings, assets and financial status before and after the infection and other relevant economic factors. In this section, information was collected regarding the respondent's employment status in terms of income and salaries. The objective was to describe the impact of the disease due to morbidity and mortality, the respondents' continuity to work and sources of income before and after the infection. It should be noted that data on the wealth of PLHIV was not collected. This was because of ethical considerations of protecting PLHIV from being identified as HIV/AIDS carriers or patients in their community, which required a visit to their homes. Interpretation of the socio-economic data from the respondents was often very difficult.

This occurred because in Sudan, salaries were low and purchasing power was limited. To overcome this problem, assets were regarded as a valid indicator of economic status. Data collection on income and house ownership measures wealth through personal possessions such as land ownership, bank account, and assets such as radios, TVs and other consumer goods (Chuma & Molyneux, 2009; Seeley et al., 1994).

The fourth section covered the coping strategies and mechanisms that PLHIV build on to deal with the impact of the disease. This section includes questions on borrowings, standards of living and existence of external assistance from the government, family and friends in order to identify the supporting networks within the

households. The fifth section incorporated questions on living expenses. It primarily focused on the household expenditure and wealth not ignoring the lifestyle changes resulting from HIV/AIDS. The sixth section covers the respondents' medical and risk history and included questions such as mode of transmission of the virus. The data collected was subsequently analysed and used to determine the factors that have contributed to heighten the risk of HIV/AIDS (Cameron, 2007). The seventh and last section was on healthcare utilisation. The health-related questions included hospital admission, hospitalisation period and costs besides enquiring whether the affected individual had been continuously sick during the period of data collection.

The non-response was very low and only five people (0.9%) declined to be interviewed, as they were uninterested, aggressive and uncomfortable. During the interviews, observations were recorded to identify the factors that lead to increased risk of the infection, including changes in lifestyle and household wealth.

3.3.1.1.1 Pre-testing of the Questionnaire

One of the most valued and recommended procedures in quantitative research is to run a pilot test of the research instrument before conducting the main survey. The pilot study assists the researchers to know what they need to know and how they can best find it out (Van Teijlingen & Hundley, 2002). The process requires administering the questionnaire to a small group of people from the study population. In order to validate the design of the questionnaire and suitability of wordings of the questions, it is important to obtain feedback to attract and convince people to participate in the survey.

A pilot survey was carried out during the period from 2-10 of October 2011 to test the research instrument, after consultation with the supervisors and the Sudan National AIDS Control Programme authorities. The pilot survey was carried out at the

Omdurman Teaching Hospital in Khartoum State mainly at the VCT/ART centre. The centre was selected, as it see a large number of PLHIV come for counselling sessions, treatment or having CD4 tests and viral loads performed. The pre-test for the present study was conducted among a group of fifteen PLHIV, which included both male and female subjects.

As a result of the interviews and from the analysis of the findings, several changes were made to the main questionnaire. New questions were developed to replace those where the results from the pre-test were not consistent with the theories that explain the study. The following modifications were made on the final version of the questionnaire:

1. Questions like “What are the sexual risk behaviours that you engaged in after the infection? Is the ART available in the pharmacy? Were removed because respondents found not willing to answer.
2. Some new issues were raised during the interview, as the respondents showed willingness to discuss extra issues that issues help in addressing the deep account on healthcare services. Thus, new questions added include “Have you received money from someone else to pay for your healthcare? And who provided the drugs for you?”
3. A question pertaining to the reasons behind children not in school after their parents infected by the virus was added, because when we asked PLHIV about whether their children were still in school, they voluntarily spoke about the reasons, This will help us to identify survival of children born to infected persons

Respondents felt comfortable if questions began with the general demographic and economic topics and the transmission topics highlighted later. They also felt at ease

in responding to questions in the early morning. Hence, it was necessary for most of the interviews to be conducted in the morning.

3.3.1.2 Data Collection Procedure

The procedures, guidelines and documentation used for the data collection methodology were carefully discussed with the expert groups and authorities working with PLHIV. To ensure timely and systematic implementation of the methodologies, issues on logistics, administration and finance were also addressed.

The survey was conducted with close participation and assistance from SNAP, the official representative of the Ministry of Health, and the States AIDS Control Programmes to provide technical assistance in facilitating the data collection process. The survey was carried out during the period from 15/October 2011 to 28/ February 2012 , beyond this period, as justified by authorities in SNAP and the HCPs working in these centres many patients were not expected to visit the centres due to shortages in drugs and availability of the CD4 machines.

In addition, the research activities were conducted in close collaboration with the PLHIV associations. These associations created a space in which PLHIV were able to meet privately with counsellors and other HIV positive people to discuss their experiences and problems they faced daily interacting in their community. The difficulties faced by PLHIV in their emotional and physical states made these associations meaningful and inevitable. With the space and conducive atmosphere provided, the infected people were able to speak freely with controlled emotions.

The researcher was trained on how to approach PLHIV. This experience facilitated the development of mutual trust with the sample under the study and provided valuable opportunities to acquire skills in assessing the communities'

characteristics. Each respondent was interviewed separately in a consulting room of the hospital specially set aside for this purpose. At the end of each day of the survey, all the completed forms were collected and checked for consistency. As Friday is a rest day and public holiday in Sudan, few patients are admitted. The Healthcare Providers (HCPs) working in these centres, were cooperative and this study benefited immensely from their experiences in communicating with the patients (see Table 3.2).

Table 3.1: Types of Healthcare Services Provided at VCT Centres

No.	Title	Service delivered
1-3	Counsellors	Counselling
1-2	Statisticians	Recording and reporting
1-2	Medical officers and physicians	Treatment
1-2	Lab technicians	Testing
1-2	Pharmacists	Provision of ART drugs

Source: The PLHIV Survey- May to September 2011

While conducting this interview, ethical and personal issues was introduced, which involved an intensive interaction with participants, and confidentiality was established. The interviews with the respondents were conducted in a conducive atmosphere to ensure that data collection is effective to reduce any influence on their responses as shared by Vanderback (2005).

It is important to point out that all the fifteen pre-test samples (from Khartoum state) were included in final data analysis because they entered the VCT/ART centres to pick up their drugs and they voluntary participated in the survey. The final survey included 555 PLHIV participants. There is no missing data from the final survey, as the researcher ensured that all the questions were answered.

3.3.1.2.1 Research Settings and Sampling

Sampling is a process of selecting a portion of the population but must be representative of the entire population to achieve quality results. The data was collected from a subset of individuals who fulfilled the requirements of the study (Polit & Hungler, 1995).

The two essential types of sampling are random sampling (probability-based designs) and non-random sampling (judgmental designs). Random sampling involves a random selection of subjects from a population having the same opportunity of being included in the sampling unit. Statistical inferences are made on the sampled population from the data of the sampling unit. It provides reproducible results within uncertain limits. Most common techniques used are simple random sampling, stratified, cluster and multi-stage sampling.

In non-random sampling, the respondents are usually selected based on their availability and representativeness because of expert knowledge or professional judgment. The main feature of this type of sampling is that it is less expensive, easy to implement and depends upon expert knowledge. Examples of the techniques used for this type of sampling are snowball, judgmental and quota sampling.

Random sampling involves a random selection of subjects from a population having the same opportunity of being included in the sampling unit. Statistical inferences are made on the sampled population from the data of the sampling unit. It provides reproducible results within uncertain limits. Most common techniques used are simple random sampling, stratified, cluster and multi-stage sampling. In this method, each individual has the same probability of being chosen at any stage during the sampling process. Thus, this study used random sampling. This technique used, because all PLHIV were diagnosed as infected persons, all on the age range from 14-49, and all enter the VCT/ART centres for the same reasons such as medical check-up

and/or takes their drugs. If non-random sampling was applied, the sample might not be an accurate representation of the HIV/AIDS infected population in the study areas because it was necessary to protect the privacy of the HIV/AIDS patients. The data collected was subsequently used to verify the factors that led to the HIV/AIDS infection and to illustrate the coping strategies and changes in the standards of living among PLHIV.

3.3.1.2.1.1 Sample Size

An important feature of any empirical study is the sample size where the goal is to make inferences about a population from a sample. In general, an appropriate size would be one that is large enough to show some variability in the attributes being measured. It is also necessary to produce results among variables that are significantly different. Evans et al. (2000) indicated that a sample size constituted a number of observations, which are used for calculating estimates of a population.

We have calculated purposive sample size for this study. The sampling interval was calculated as the ratio between the population size and the sample size. The sample size was calculated according to a formula, which reached a certain desired margin of error in the results. The researcher followed the same method used in health studies (see Lwanga & Lemeshaw, 1991). The present study calculated the sample size based on the estimation of the prevalence of HIV/AIDS epidemic in Sudan. It is calculated for each category (on average) to give a maximum error of (0.02) with a probability of ($\alpha = 0.05$). Calculation of the sample size is as follows:-

$$n = \frac{t^2 \cdot p \cdot q \cdot deff}{d^2} = \frac{(1.96)^2 \times (0.04) \times (0.96) \times 1.5}{(0.02)^2} = (553.1904) = 555$$

Where, n is the required sample size

$p = 0.04$ Probability of target group affected by HIV/AIDS economic impact

$q = 0.96$ (1-p) probability of family not affected by HIV economic impact

$d = 0.02$ Margin of error (The degree of accuracy)

$t = 1.96$ Value in normal curve corresponding to 95% level of confidence

D. Eff. = 1.5 Design effect (research was conducted in 7 out of 15 states where HIV/AIDS has high prevalence rates (SNAP, 2010)).

3.3.1.2.1.2 Selection Criteria of the Sample

The total sample of the respondents was (555) selected randomly from people living with HIV/AIDS during their regular visits to the VCT/ART centres. These centres serve all PLHIV from the surrounding townships. In the centre waiting room before receiving their drugs, a counsellor (who was aware of the study eligibility criteria) gave patients an information describing the study (the objectives of this study). Those who were interested were referred to researcher for more information, when the patient shows willing to participate, the researcher will start the interview. The survey was scheduled according to the date and time of the clients' visits either to receive their drugs or to do a medical check-up.

Probability proportional to size (PPS) was used to select the proper sample from each VCT/ART centre within each State targeted in this study. This sampling method is most useful when the sampling units vary considerably in size because it assures that those in larger sites have the same probability of getting into the sample as those in smaller sites, and vice versa.

Table 3.1 shows the selection of the sample size of the respondents from each state. It should be noted that the VCT/ART centres were chosen due to the large numbers of registered PLHIV and this selection done with close coordination with Sudan National AIDS Control Program. Table 3.1 shows that the number of PLHIV

registered in the VCT/ART centres selected in this study was 2735 (SNAP, 2011). Table 3.1 also shows that the HIV prevalence is higher in Eastern States mainly Red Sea State, and Western states because of the continuous civil war and displacements and high numbers of refugees. The population is higher in Khartoum State, which indicates the high numbers of registered PLHIV.

The research used systematic random sampling to apply the randomness selection, to ensure that there is an equal chance of selecting each unit from within the population under the study. The units of the population (PLHIV) are randomly ordered with respect to age characteristic, this because all the PLHIV registered in VCT/ART centres are between 16-49 years. The researcher start the process by selects an integer by referring to the medical records of the PLHIV in every VCT/ART centre (See table 3.2). The researcher divides the total number of the population with the sample size to obtain the sampling fraction. The sampling fraction is then used as the constant difference between subjects (interval). This integer calculated as follows:

$$K = N/n = 2735/555 = 4.9 = 5$$

Where: K = sampling interval, N = population size (total number of PLHIV in Sudan registered) 2735, n = the sample size (555)

Then, the process of the sample selection started by selection of a random starting point between 1 and 5. The random starting point was (4), Then the subjects selected are 4,9, 14.... Until the research reached the total number of the sample size (555)

Respondents were 18 years and above and have been infected by HIV/AIDS for at least one year, and willing to participate were eligible to participate in the survey. Exclusion criteria included people with no official HIV diagnosis and those who were too ill to participate. These criteria were selected because, being willing and able to provide informed consent, the time limit of infection selected because, being able to

provide information on their experience with coping with the impact of the disease (before and after the infection) related to employment, income, children schooling etc. to achieve objectives four and five.

Table 3.2 Selection of the sample size of PLHIV (Sample size 555)

State	Total of Population	HIV Prevalence Rate	VCT/ART Centres	Number of PLHIV	Sample reviewed during the Survey period
Khartoum State	5.274.321	0.11	Omdurman Teaching Hospital	1059	215
			Omdurman Military Hospital	106	22
			Bahri Teaching Hospital	121	25
			Elban Gadeed Hospital/Bahri/Alhaj Yousif	32	6
			Alkhartoum Police Hospital – Alribat	57	12
			Khartoum Teaching Hospital	130	26
			Bashire Hospital/Azhari	302	61
			Total	1807	367
Eastern States					
Kassala State	1.789.806	0.21	Kassala Teaching Hospital	186	38
			Halfa Hospital	15	3
			Elshgrab Hospital	9	2
			Total	210	43
Gedarif State	1,348.378	0.1	Gedarif Teaching Hospital	172	35
			Gedarif Military Hospital	6	1
			Doka Hospital	6	1
			Total	184	37
Red Sea State	1.376.110	0.54	Port-Sudan Teaching Hospital	203	41
			Port-Sudan Family Planning Centre	147	30
			Total	350	71
Western State					
South Darfur	1.406.404	0.11	Nyala Teaching Hospital	84	17
West Darfur	1.308.225	0.22	Eljinina Teaching Hospital	30	6
Blue Nile State	832.112	0.36	Damazine Teaching Hospital	70	14
			Grand Total	2735	555

Source: Number of Population (Sudan Population Census, 2008)

Not: Number of PLHIV registered in each VCT/ART centres, prevalence rate, number of HIV+ persons (SNAP annual Surveillance Report 2011).

3.3.1.2.1.3 Study Area and Population

The population under study included all people living with HIV/AIDS in the study area. The respondents selected from the VCT/ART centres and PLHIV Associations from seven states in Sudan out of 15 states (State of Khartoum (capital of Sudan), the eastern States of Red Sea, Kassala and Gedarif, the western States of South Darfur and West Darfur and the Central State of Blue Nile). The study areas were selected due to the high prevalence of HIV/AIDS compared to the remaining States (SNAP, 2010) and after consultation with the national authorities from the Ministry of Health and SNAP. Because the general prevalence for the country is relatively low (0.24%), thus, selection of the States with higher prevalence was preferred to be able to complete the required sample size that can give meaningful results in a cost effective way. In addition, attempts to enhance the efforts of the policy makers in Sudan to possibly intervene to reduce the prevalence and mitigate the impact of HIV in the selected states without overlooking the general population.

3.3.1.3 Ethical Considerations

The study required interactions with people living with HIV/AIDS during each day of the survey. Proper care was taken to ensure that the methods used were sensitive to ethical considerations, particularly towards the participants. De Vaus (2013) reported that ethical considerations such as voluntary participation, exposure to harm, confidentiality, anonymity, and privacy should be adhered to. The research was carried out after obtaining approval from the National Health Research Ethics Committee of the Federal Ministry of Health for ethical clearance to collect data from the PLHIV (See appendix B). The number of the committee members was about nine and represented different officials from Ministry of Health, universities and other related ministries.

The process included the issuance of official letters by SNAP, fulfilling ethical considerations through completion of the committee's technical form and presentation of the research proposal after discussion with the technical committee members. Official letters issued by the Sudan National AIDS Control Programme were then sent to each State's HIV/AIDS programme and to the VCT/ART centres of the study areas mentioned. There are a total number of 132 VCTs and 34 ART centres in Sudan (SNAP, 2010). A total of 18 centres were selected from each state under the area of the study due to large numbers of PLHIV (see table 4.1). Participation in the study was voluntarily and confidentiality was assured. The cases were coded for easy identification and subsequent follow-up.

3.3.2 The Sudan Household Health Survey

In order to support and substantiate the quantitative findings and identify the factors leading to exposure to HIV/AIDS, the present study uses data from the 2010 Sudan Household Health Survey (round 2). The Federal Ministry of Health (FMOH) and the Central Bureau of Statistics (CBS) of the Republic of Sudan conducted the second Sudan Household Health Survey (SHHS2) from March 2010 to May 2010. This was done in collaboration with several ministries and institutions of the government of Sudan, namely, the Ministry of International Cooperation, Ministry of Education, Ministry of Welfare and Social Security National Population Council, National Council for Child Welfare (NCCW) and the National Water Corporation.

Other regional and international organisations involved were the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the United Nations Population Fund (UNFPA), World Food Programme (WFP), WHO, United Nations Joint Programmes on HIV/AIDS (UNAIDS), Pan Arab Project for

Family Health (PAPFAM), Japan International Cooperation Agency (JICA) and the United States Agency for International Development (USAID).

As a basis for action, the data generated from the SHHS2 are expected to assist in illustrating the current status relating to some of the main indicators of the Millennium Development Goals (MDGs), World Fit For Children (WFFC) goals, Programme of Action adopted at the International Conference on Population and Development (ICPD) and other international and national approved goals. The data gathered here assisted as expected.

The survey covers a wide range of topics and provides data on the key socio-economic and demographic variables. It includes the most recent and detailed information such as the welfare of children and women in Sudan and epidemical and behavioural data on HIV/AIDS among the general population. It helps in the study of sexual behaviours among the Sudanese population and in investigating the relationship between level of education and HIV/AIDS knowledge and sexual behaviour. To achieve the goals and reach the objectives of this research, the survey provides important variables for data analysis.

Information on the household's ownership of consumer valuables such as television sets, bicycles and construction materials for housing was collected from SHHS to measure the household's wealth status. Other information included was amenities such as electricity, hygiene water, and type of toilet facility. By using these items from the survey, a standard procedure was developed, to construct a "wealth index" to quantify the variances in household economic status.

The wealth index is the easiest and practical measure of economic status that produces superior and accurate results of the health outcomes compared to expenditure measures (Filmer & Pritchett, 2001; Montgomery et al., 2000). It describes the economic variations in health outcome, healthcare utilisation and other related variables

(Mohanty, 2009). It is a composite measure of cumulative living standards of households, thus, placing individual households on a continuous scale of relative wealth (Filmer & Pritchett, 2001).

The wealth index in the SHHS was divided into population quintiles, with the lowest quintile representing the poorest and the highest quintile representing the richest. The quintiles represent a combination of increased economic status. Every household that scored percentage of the assets and services are assessed in the wealth index to categories them into quintiles. The wealth index differentiates between the socio economic status of household and community in terms of assets and services (Howe et al., 2010). The wealth index quintiles is highly used in assessing poverty status in health planning studies (Pitchforth et al., 2007; Howe et al., 2010; Balen et al., 2010).

3.3.2.1 Sample size

The SHHS selected an estimated, 15,000 households, out of which 14,921 were found to be occupied. Of these, 14,778 were interviewed successfully. In these households, 18,614 women (aged 15-49 years) were identified for the interviews, out of which 17,174 were interviewed, yielding a response rate of 92.3 percent. Although 16,448 men were identified, only 5,573 men could be interviewed, yielding an overall response rate of 33.9 percent. The study selected randomly, a purposive sample size of approximately 10 percent of the men (500) who responded. The same survey sample size was also selected for the women. Thus, the total sample size was 1000 with complete and no missing data. The selected sample size was still large enough to permit an appropriate statistical analysis (Fang-Ming, 2006; Hancock & Mueller, 2006).

3.3.3. Selection and Conduct of the Focus Group Discussions among PLHIV

The researcher used FGDs in league with other methodologies in a form of triangulation or mixed methodological approaches for more robust data, bearing in mind the central role occupied by data in the scientific research process (Boateng, 2012). This was especially helpful when seeking to validate the quantitative data used from the PLHIV survey. What makes FGDs unique to other qualitative data collection methods is that it provides social interaction between the moderator and participants for greater insights into the collected data.

The process is facilitated by the moderator who is there to lead the discussion in the 'right' direction and to ensure that all participants have the chance to express their opinions. It increases the sample size of a report by talking with numerous people at once. Moreover, can provide access to forms of data that are not obtained easily with either individual key-informant or in-depth interviews, also provide direct evidence about similarities and differences in the participants 'opinions and experiences as opposed to reaching such conclusions from post hoc analyses of separate statements from each interviewee (Lehox P, Poland B, & Daudelin G. 2006). In addition, it provides more depth and detail about the opinions and experiences of any given participants as opposed to in-depth interviews. FGDs can help researchers and program managers discover and explore themes or processes, generate illuminating and illustrative personal narratives, and uncover attitudes or ideas that are common among members of PLHIV. It offers the researcher the opportunity to interview several respondents systematically and simultaneously (Babbie, 2011).

The correlation and regression calculations from the PLHIV survey data provided a statistical view of the selected demographic and socio-economic variables, while the FGD analysis was based on the real lives and circumstances of PLHIV. The latter complemented the statistical findings resulting in a clearer picture of the impact

of HIV/AIDS on the standard living of PLHIVs. Thus, the main objective of the FGDs was to supplement the knowledge of PLHIV gained from the primary survey, which was either missing or difficult to obtain. The use of the qualitative method not only enabled the researcher to recognise the PLHIV during the FGDs but also to know their personal understanding of poverty and vulnerabilities.

3.3.3.1 Sample Size

When the perception of the incidence of the disease is as low as 10 percent and target to reduce the risk to less than 5 percent, a sample of 30 can be the best choice in a random selection of a qualitative study in line with DePaul (2000). This calculation method was used to ensure that, if there is an attribute or opinion with an incidence as low as 10 percent, the researcher was likely to have at least one respondent to speak for it. Thus, the present study undertook purposive sampling of 30 volunteers of PLHIV. The participants are drawn from all 15 States in Sudan. The selection of the participants was based to their having been HIV-positive for more than two years to be able to express their experience with HIV. There were members of official PLHIV associations as most informed and knowledgeable people, and those who have worked as ART adherence supporter with other HIV infected persons, which enable them to obtain minimum experience on their coping strategies.

Table 3.2 shows the focus group composition and the topics discussed. The FGD questions are found in Appendix (D). These topics were taken from secondary sources such as research studies on the impact of HIV/AIDS. The selection process of the sample was carried out with the assistance of SNAP and the directors of the federal association of PLHIV. A trial run was undertaken to test these questions.

The consent, confidentiality, security of the participants and the collection and storage of the data and dissemination of the results of the research were of paramount

importance throughout the research process. The FGDs were conducted in Arabic, the mother tongue of the Sudanese people, and then translated into English.

Table 3.3 Composition and Topics of the Focus Group Discussions among 30 Respondents

Demographic Characteristics of the Respondents		Group 1 (10 persons)		Group 2 (8persons)		Group 3 (6 Persons)		Group 4 (6 Persons)		Total		Topic Discussed
		No.	%	No.	%	No.	%	No.	%	No.	%	
Gender	Male	6	60%	3	37.5%	3	50%	3	50%	15	50%	<ul style="list-style-type: none"> • Demographic and Socio-economics characteristics of the respondents • Information related to risk taking behaviour • Identification and prioritization of the root problems of HIV infection: • Information related to impact of HIV/AIDS • Coping mechanisms • Information related to income and savings: • Stigma and Discrimination • Information related to opportunities within the community • Protective methods against HIV infection (Details of the topics found in appendix E)
	Female	4	40%	5	62.5%	3	50%	3	50%	15	50%	
Marital Status	Single	2	20%	1	12.5%	1	16.7%	1	16.7%	5	16.6%	
	Married	5	50%	3	37.5%	2	33.3%	4	66.7%	14	46.6%	
	Divorced	1	10%	2	25%	1	16.7%	1	16.7%	5	16.6%	
	Widowed	2	20%	2	25%	2	33.3%	0	0	6	20%	
Employment Status	House wife	2	20%	2	25%	1	16.7%	1	16.7%	6	20%	
	Unemployed	3	30%	3	37.5%	3	50%	3	50%	12	40%	
	Daily Worker	4	40%	2	25%	2	33.3%	2	33.3%	10	33.3%	
	Government Employee	1	10%	1	12.5%	0	0	0	0	2	6.6%	
Education Level	Uneducated	4	40%	3	37.5%	2	33.3%	2	33.3%	11	36.6%	
	Educated at Primary Level	3	30%	2	25%	1	16.7%	1	16.7%	7	23.3%	
	Educated at Secondary Level	2	20%	2	25%	2	33.3%	3	50%	9	30%	
	University	1	10%	1	12.5%	1	16.7%	0	0	3	10%	

Source: FGDs among PLHIV 2011

3.3.3.2 Procedure of the FGDs

What makes FGDs unique to other qualitative data collection methods is the relatively low cost and they provide quick results. Provide social interaction that occurs between the moderator and participants and how they feed off of each other's responses. The moderator who is there to lead the discussion in the 'right' direction and make sure that all participants get a chance to express their opinions facilitates the whole process. It increases the sample size of a report by talking with numerous people at once. Moreover, it can provide access to forms of data that are not obtained easily with either individual key-informant or in-depth interviews, also provide direct evidence about similarities and differences in the participants' opinions and experiences as opposed to reaching such conclusions from post hoc analyses of separate statements from each interviewee (Lehox, Poland & Daudelin, 2006). In addition, it provides less depth and details about the opinions and experiences of any given participants as opposed to in-depth interviews.

The Sudan National AIDS Programme assisted in issuing an official letter to the PLHIV Associations in Sudan for recruiting participants. This was followed by e-mails, phone calls and other means of personalised contacts to confirm attendance. The interviews were conducted in free and comfortable atmosphere in collaboration with the PLHIV association at the State of Khartoum, capital of Sudan in November 2011. Drinks, snacks and transportation fees were freely provided for the respondents to encourage frank and full disclosure of information. The participants were divided to four groups. Each group consisted of six to ten persons and comprised a variable mix to represent the socio-economic and gender differences, as all the participants were members in PLHIV associations, and they are very familiar to each other (see table 3.3). This method allowed a comprehensive observation of the coping strategies between men and women.

All the FGD members were informed of the ground rules before facilitating the discussions. Every participant respected the privacy of the other participants and the conversations were not repeated outside the focus group. Only one person spoke at a time to ensure that everyone respected the opinions of the others. Everyone had an equal chance to participate in the group discussion. The participants generated the discussions by commenting on each other. This helped in clarifying and validating the information gathered in the survey. To obtain in-depth information concerning their socio-economic status before and after the infection, a structured conversation was conducted. This served as a forum to clarify concepts such as, stigma and discrimination due to the infection. The discussions with each group took two (2) to three (3) hours.

In Figure 3.2 (See appendix F.), the photo shows the discussion with one of the FGDs among PLHIV, the discussion guided by the researcher and note taker. The participants agreed to take the photo, with possibility that, having censored photo. It shows that the participants were gender mixed (male and females). Beside the notes taking as seen in the photo (see appendix F.), the recorder used to make sure PLHIV's ideas are not lost and have a more complete, accurate, and permanent record. A tape-recorder was used after getting the group's permission. In addition, the photo shows that the participants felt comfortable and actively encouraged to not only express their own opinions, but also respond to other members and questions posed by the researcher.

To ensure reliability and conformability, the researcher who doubled as a 'note-taker' personally collected the data. The responses and conversations of the respondents recorded on tape were audible enough to make the transcription possible. The researcher (facilitator) coordinated and guided the conversations by ensuring that all opinions were reported and that the participants restrict their comments on the

topics. A structured set of questions was used to guide the conversations and reach the intended goals. Accurate details and comments of the participants were captured whilst interesting shifts in conversation and group dynamics were noted. The discussions recorded on tape were also checked for completeness. Transcribing involves translating from an oral language, with its own set of rules, to a written language with another set of rules.

Sliverman (2005) argued that reliability in qualitative studies can be enhanced when interviews are audio taped and then transcribed to enable indication of overlaps and side comments. The researcher was able to tape record and take notes from almost all the respondents including the key informants. To obtain these accumulated voluminous collection of tape recordings and notes, the researcher had to transcribe so that they were legible.

Scissor-and-sort technique was used to analyse the data which is most cost-effective method for analysing a transcript of a focus group discussion (Ryan & Bernard, 2003). The researcher goes through the transcript and categorizes those sections of it that are related to the research questions. Transcripts were read many times to identify the recurring themes. A coding tree was developed and practically applied to the text. Colour-coded sentences or long exchanges between individual respondents were used to mark different themes within the text. Then each piece of coded theme was cut out and sorted so that all material related to a particular topic is placed together. This cutting and sorting process was carried out on a word-processing program. Transcripts were read many times to identify the recurring themes. After the coding, memos and display matrices were developed to examine each code for sub-themes, nuances, apparent contradictions and patterns across the interviews.

Data analysed from the four FGDs was merged into one data set. This involved extracting the most salient ideas from the 100 pages of the four focus group transcripts

and resulted in a core group of approximately 75 core statements that reflect participants' diversity of experiences. After the conclusion of the focus group discussions, the analysis was done quickly to avoid missing gaps. To avoid errors experts were involved in the data review and analysis.

3.4 Summary

This chapter described the rationale behind the research methods employed, including, research design, sampling procedure and data collection methods. It investigated the livelihood framework of the relationship between poverty and HIV/AIDS. The methodology adopted in this study is mixed method approach, using quantitative data drawn from a survey questionnaire and the qualitative data collected from FGDs among PLHIV in Sudan.

In order to gain a better understanding and examine the vicious circle of poverty and HIV/AIDS, national survey data from the 2010 Sudan Household Health Survey was employed to analyse the impact of poverty on HIV/AIDS. The study used different data sets and attempts to link the analysis with the conceptual framework to draw a comprehensive conclusion on this complex study. In addition, the study applied a model using structural equation modelling, which examines the socio-economic factors of HIV-risk behaviours.

CHAPTER 4

Impact of Poverty on HIV/AIDS among Men in Sudan: Findings from the 2010 Sudan Household Health Survey

4.1 Introduction

This chapter has the sole goal of presenting an empirical analysis aimed at identifying and quantifying the impact of poverty on HIV/AIDS among men in Sudan. It analyses the quantitative elements of the national survey data sourced from the 2010 Sudan Household Health Survey. The previous chapter detailed the methodology adopted in this study, and the design and application of the mixed methods research approach. The results of the national survey data are supplemented by data and observations gathered from the focus group discussions. The purpose was to attain greater understanding of the drivers and factors that increase people's vulnerability to HIV/AIDS in Sudan, such as risky sexual behaviour associated with low economic status (inability to meet basic needs, unemployment, food insufficiency, illiteracy (unaware of prevention methods against HIV), and gender inequality (socio-cultural factors such as lack of condom use, lack of negotiation sex among women and FGM practices).

This chapter was structured in sections. Section 4.1 provides a brief introduction on the methods, data treatment and organisation of this chapter. Section 4.2 discusses the data treatment and the statistical techniques used in the analysis of the survey data. Section 4.3 illustrates and discusses the analysis and findings, and includes demographic characteristics of respondents and the result of the full structural model. Section 4.4 discusses the results of hypotheses testing. Within the confines of these sections, this chapter demonstrates whether the findings of the study are consistent with

the adopted theories and reviewed literature, and whether it answered the research questions outlined in chapter 1. Furthermore, it attempts to accept or reject the first three hypotheses outlined in chapter 3. Section 4.5 summarises the findings and provides the conclusion for this chapter.

4.2 Method and Data Treatment

This section provides details of the methods used to treat the collected data. It includes a presentation of the reliability and validity of the data used in the analysis.

The study analysed secondary data from the Sudan Household Health Survey (SHHS) in 2010. The SHHS survey (2010) focused on age cohort of 15 to 49 years men in each household from a sample of 16,448 men. Of these, only 5,573 men were interviewed, yielding an overall response rate of 33.9 percent. In line with Odimegwu (1999), the existing study selected a randomly purposive sample of approximately 10 percent (from those who responded to the survey (5,573 respondents)). Thus, the sample size selected for this study was approximately (500). The remaining data were removed due to missing and/or incomplete information.

4.2.1 Data Treatment

This section details the variables used in this study with detailed accounts of the measurement method.

4.2.1.1 Measurement of the Variables

The poverty environment is characterised by exposure to cumulative, adverse, physical, economic and social pressure stressors, high levels of violence and other factors that may expose people to HIV (Evans & Miguel, 2007). We used data from the survey to investigate the extent to which poverty indicated by low socio-economic

status affects sexuality, gender inequality, and lack of knowledge on HIV/AIDS among young people as mediating factors.

The SHHS survey tools consisted of five sets of questionnaires:

- (i) A household questionnaire, which was used to collect information on all de jure household members (usual residents);
- (ii) A women's questionnaire administered to all women aged 15-49 years in each household;
- (iii) A children's questionnaire administered to mothers or caretakers of all children under five years of age living in the household;
- (iv) A men's questionnaire administered to all men aged 15-49 years living in the household; and a
- (v) Food security questionnaire.

This study used the questionnaires for individual women and men, which included the following modules:

Men and Woman's background and characteristics (this include wealth index)

Marriage

Child Mortality

Desire for Last Birth;

Birth History

Maternal and new-born health

Contraception

Unmet Need

Approval for Female Genital Mutilation/Cutting (FGM/C) (country specific module)

Attitude towards Domestic Violence

HIV/AIDS Knowledge

Sexually Transmitted Infections (STI) (country specific module)

Condom use

Sexually Transmitted Infections (STI)

Men's sexual behaviour

Income sources and employment status

Household expenditures

Food consumption and dietary diversity

According to the variables extracted from the SHHS, poverty status is classified by the wealth index quintiles. To measure the wealth index quintiles, the SHHS performed the principal components analysis by using the information derived from the ownership of the consumer goods, housing characteristics, water and sanitation, and other characteristics related to the household's wealth. Weights (factor scores) were assigned to each of the household's assets. Each household was then assigned a wealth score based on these weights. The population of the household survey was then ranked according to the wealth score, and was then divided into five equal parts (quintiles), from the lowest (poorest) to the highest (richest). The wealth index captured the underlying long-term wealth through information of the household assets based on the durable good ownership (Montgomery et al., 2000).

Economic status was measured by income status, employment status, monetary power to purchase condoms and food sufficiency by means of food consumption and satisfaction (Grundy & Holt, 2001). Using the wealth index does not yield results similar to those produced for income and is hence not a good proxy for income. Rather, the study used income status to predict respondent's economic status (Montgomery et al., 2000). The education variables used in the survey are measured by school attendance, level of school attended, ability to read and write, and level of education. In some countries, all levels of education were not relevant (Allin et al., 2009). The risk of

HIV and transmission was measured at the knowledge base and the sexual behavioural levels.

4.2.1.1.1 Measurement of HIV Knowledge

HIV knowledge includes different variables that measure either minimum or good knowledge about HIV prevention methods, and ways of avoiding/or protecting against transmission of HIV. All the variables used to create the construct 'HIV knowledge' had five response categories: 1= (strongly agree): 2= (strongly disagree): 3= (Not agree): 4= (occasionally) and 5= (am not sure). The respondent's knowledge of HIV was then scored on the following basis; 1 (the answer indicated having knowledge) meaning no HIV risk; 2 and 3 meant HIV-risk (the answer indicated not having knowledge). In the case of a respondent having 'don't know' or 'occasionally' as responses, the question is allotted a score of 2 indication HIV-risk (see Tladi, 2006 and refer to Table 4.1).

Table 4.1 Description of HIV Knowledge Variables

Variable	Description
Contracting AIDS through supernatural means. Contracting AIDS from mosquito bites. Healthy-looking people may contract AIDS. Contracting AIDS by sharing food with infected people.	Knowledge about mode of transmission of the HIV virus The methods of preventing HIV.
Accepting HIV/AIDS affected teacher to teach in school. Willing to afford care for affected person. Buying the food or vegetables from an infected person.	Existence of stigma and discrimination.
Knowledge on prevention of transmission of the virus from mother to her child during pregnancy. Knowledge on prevention of transmission of the virus from mother to her child through breast feeding. Knowledge on prevention of transmission of the virus from mother to her child during delivery.	Knowledge on prevention of transmission of the virus from mother to her child (PMTCT).

Source: Sudan Household Health Survey (2010)

4.2.1.1.2 Measurement of HIV Risk Sexual Behaviour

The second level is high-risk sexual behaviour. To date, condoms are the most effective means of avoiding HIV. The risk of HIV becomes more pronounced as the number of sexual partners increases, even though the number of sex partners are multiple and high, the risk can be significantly reduced with consistent and correct use of condoms (Tladi, 2006). Using condoms correctly and consistently is the most effective method in preventing HIV and a significant protective method for both men and women (Holmes et al., 2004; Hong & Li, 2009; Michielsen et al., 2008). The scores given to the respondents were as follows:

- i. More than two partners - HIV risk

- ii. Paid sexual partner- HIV risk
- iii. Not faithful to sexual partner - HIV risk
- iv. Inconsistent condom use - HIV risk
- v. Irregular sexual partners -HIV risk

This study used the same methods to measure HIV risk behaviour carried out by previous studies (Tladi, 2006; Akwara et al., 2003).

Table 4.2 Description of HIV Sexual Behaviour Variables

Variable	Description
Avoiding AIDS by using condom correctly every time.	Condom used as a protective method to avoid HIV transmission.
Avoiding AIDS by having one uninfected partner.	Being faithful to one partner used as protective method to avoid HIV risk.
Currently married or living with a woman.	Faithful to one partner decreases the transmission of HIV risk.
Number of spouses or women live-in sexual partners in the last 12 months.	
Condom use in last 12 months for all partners.	Consistent and correct use of condom reduced the HIV risk transmission.
Condom use during first sexual intercourse.	
Number of non-regular partners in past 12 months.	High or multiple partners increase the risk of HIV transmission.
Number of other wives or partners.	
Living with other partners as if married.	
Sex with any other partner in the last 12 months.	
Number of paid sexual partners in the last 12 months.	The risk of transmission of HIV virus from female sex workers (FSWs).

Source: Sudan Household Health Survey (2010)

Gender inequality variables comprise different variables such as attitude towards domestic violence (spousal abuse, battering and family abuse), female genital mutilation (FGM), polygamy and inability to negotiate sexual practices such as using

condoms (Kaye, 2004). The dependent variable (gender inequality) was measured by the under listed variables:

If she goes out without telling her husband, wife battering is justified.

If she refuses sex with husband, wife battering is justified.

If she argues with husband, wife battering is justified.

If she burns the food, wife battering is justified.

If she neglects the children, wife is battering justified.

Accepting circumcision practices and encouraging it.

Where the answer to any of these is “Yes”, this portrays the powerless and limited human rights that Sudanese women face. This coupled with their inability to negotiate sex and economic dependency on men increases their vulnerabilities to HIV (Garcia-Moreno & Watts 2000; Allin et al., 2009).

4.2.2 Statistical Analysis Methods

The statistical analysis was performed using the software package for statistical analysis (SPSS) for Windows version 20 (SPSS; Chicago, IL, USA). Chi square was used to strengthen argument in the descriptive analysis. The following Chi- Square Formula has been applied in the analysis:

$$\chi^2 = \sum \frac{(\text{Observed Value} - \text{Expected Value})^2}{(\text{Expected Value})}$$

The study used Structural Equation Modelling (SEM) and the Analysis Moment Software (AMOS) to analyse and examine the casual relationship between poverty and HIV and vulnerability to HIV risk in Sudan. SEM has been recognised as a combination of exploratory factor analysis and multiple regressions (Schreiber et al.,

2006). It assists in analysing the complex theoretical models and test the theoretical assumptions against empirical data that enables the construction of the unobservable variables (attitude, perception and awareness), which is based on multiple indicators. This advanced statistical technique provides a more enriched and objective evidence on such a complex issue.

Noteworthy, SEM is a statistical method that can be used to develop suitable statistical models of data, validate theoretical predictions and realise the actual process that generates the observed data (Kaplan, 2008). On the other hand, SEM is a statistical technique that can reduce the number of observed variables into a smaller number of unobserved variables (latent) by examining the co-variation among the observed variables (Schreiber et al., 2006). Furthermore, SEM is a statistical technique that uses a confirmatory (i.e., hypothesis testing) approach to analysis (Byrne, 2013).

This research used the SEM for its data analysis because it serves a similar statistic function to multiple regressions. In addition, it is more powerful than multiple regressions since it can ignore some of the assumptions of multiple regressions like non-linear and correlated independents. Byrne (2013) concludes that SEM is a preferred data analysis technique because of the following advantages:

Flexible assumptions as it allow interpretation even in the face of multi-co linearity.

It does not test the path coefficients individually but tests the model as a whole.

Interaction of variables can be modelled using SEM.

The model can be stated graphically.

The ability to test the model with multiple dependent variables.

The ability to model mediating variables.

The following formula has been applied in the analysis:

Step 1

Regress the dependent variable (HIV) on the independent variable (Poverty). In other words, confirm that the independent variable is a significant predictor of the dependent variable.

Independent Variable \longrightarrow Dependent Variable

$$Y = \alpha + \beta X + E_Y \text{ _____} 4.1$$

where alpha α and beta β are coefficients to be estimated and E_y is an error term

$$Y_1 = \beta_0 + \beta_1 X_{1j} + \dots \beta_r X_{rj} + e_j \text{ _____} 4.2$$

$$X_1 = \alpha_1 + \beta_1 X + e.X_1 \text{ _____} 4.3$$

$$X_2 = \alpha_2 + \beta_2 X + e.X_2 \text{ _____} 4.4$$

Step 2:

Regress the mediator (Economic status, Education, Gender inequality) on the independent variable (Poverty). In other words, confirm that the independent variable is a significant predictor of the mediator. If the mediator is not associated with the independent variable, then it could not possibly mediate anything.

Independent Variable \longrightarrow ~~Mediator~~

$$Me = \beta_{20} + \beta_{21} X + E_2 \text{ _____} 4.5$$

Where Me is the mediator

Step 3:

Regress the dependent variable on both the mediator and independent variable. In other words, confirm that the mediator is a significant predictor of the dependent variable, while controlling for the independent variable

This step involves demonstrating that when the mediator and the independent variable are used simultaneously to predict the dependent variable, the previously significant path between the independent and dependent variable (Step #1) is now greatly reduced, if not non-significant.

$$Y = \beta_{30} + \beta_{31} X + \beta_{32} Me + E_3 \text{ _____} 4.6$$

4.2.2.1 Assessment of the Measurement Model: Validity and Reliability

Validity and reliability are both very important methodological measures used in designing and conducting appropriate and accurate qualitative and quantitative research. Validity is defined as the ability of the instrument to measure a construct and is concerned with the quality of the research components. When researchers measure behaviours, their basic preoccupation is to ascertain whether they are measuring what is intended to measure (Bollen, 2014). In scientific research, the accuracy of measurements is very important. The reliability of a research instrument means the extent to which the instrument produces consistent results on repeated trials (Gay, 1987).

4.2.2.1.1 Reliability of the model

Before conducting data analysis, it is important to first test the internal reliability of the scales by measuring a latent variable using Cronbach's alpha coefficient, which can be calculated using the SPSS software. The alpha coefficient obtained in this study was high for the five constructs in the model. Table 4.3 shows that Cronbach's alpha coefficient estimates for the five constructs used in the model (Poverty, HIV, Economic Status, Gender equity and Education) were between the ranges of 0.738 and 0.954. The poverty construct consisted of five items, showing a reliability score of 0.820. The HIV construct consisted of twelve items, showing a reliability score of 0.817. The gender equity construct consisted of eight items, showing a reliability of 0.954. The economic status construct consisted of five items showing a reliability score of 0.738. Finally, the education construct consisted of five items with Cronbach's alpha of 0.829. Thus, the value of the overall data reached the internal

reliability requirement, implying that all the items in the instrument contributed to the consistency scores as reported by Gefen et al. (2000).

Table 4.3

Internal Reliability of the Measurement Model

Construct	Items	Cronbach Alpha ≥ 0.70
Poverty	5	0.820
HIV	12	0.817
Education	5	0.829
Economic Status	5	0.738
Gender Inequality	8	0.954

Source: SHHS Survey (2010) results using SPSS software

The study found that four items had a factor loading of less than 0.5 from the HIV construct. Two items from poverty and one item each from economic status and education constructs were removed. Table 4.3 presents the number of final items and final measurements of Cronbach's alpha for this study.

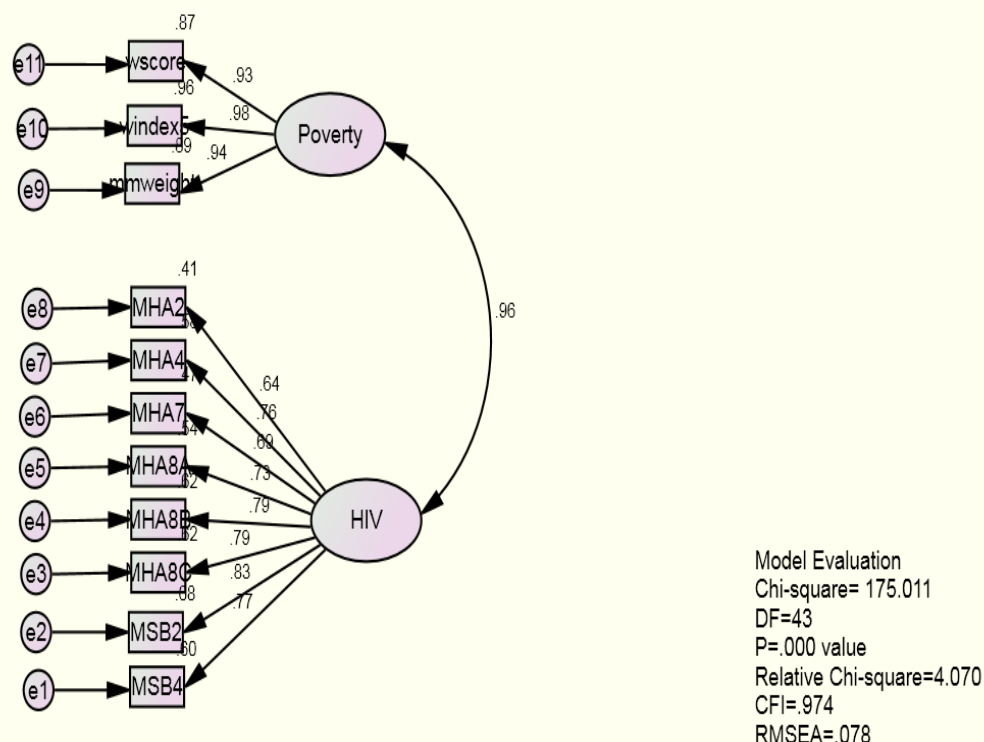
4.2.2.1.2 Confirmatory Factor Analysis: Assessing Pooled Measurement Model

A major component of the Confirmatory Factor Analysis (CFA) is testing the reliability of the unobserved variables. The CFA is used to minimise the differences between the estimated models. As part of the procedure, the factor loadings and modification indexes (should a variable be dropped or a path added) are proceeded to derive the best indicators of latent variables before testing a structural model. Some researchers suggest that using the CFA can be used to combine the measured indicators into a group if the indicators of the latent variable is less than eight items (Milfont & Fischer, 2010).

4.2.2.1.3 Poverty and HIV Measurement Model

This method combines the two latent constructs of poverty and HIV into one measurement model whilst performing the CFA. The items deletion process and re-specification is performed several times until the model reaches satisfactory fit. Four items were deleted from the HIV construct and two items from the poverty construct. This method was used because it addressed the issue of model identification problem. Figure 4.1 shows that the latent variables of poverty and HIV are combined for measurement. The CFA model placed the poverty and HIV variables together, and tested simultaneously rather than individually because the hypothesised model combined a small number of observed variables (three items) that measured the latent variable (poverty). The factor loading for all the items was above 0.6, thus, no further deletion was required for this measurement model.

In addition, the construct validity is achieved when the fitness index for the model fulfils the following requirements; the Root Mean Square Error of Approximation (RMSEA) equals 0.08 or less, the Comparative Fit Index (CFI) equals 0.90 or higher, the chi-square/df is less than 5.0 and the P- value is 0.000 (Marsh & Hocever, 1985; Bentler, 1990; Browne & Cudeck, 1993; Wheaton et al., 1977). Table 4.4 shows that the measured model has a satisfactory fit.



Source: SHHS (2010) results using AMOS Graphic Analysis

Note: Poverty measured by Wscore (Wealth score), Windex (Wealth index), Mweight (men's wealth weight) (seen in the small boxes pointed out from Poverty construct).

HIV measured by the following variables which is seen in the small o pointed out from HIV construct: MHA2 (Can avoid AIDS virus by having one infected partner), MHA4 (Can avoid the AIDS virus by using condom) MHA8A, MHA8B and MHA8C (knowledge of transmission of HIV from mother to her child during pregnancy, delivery and breast feeding respectively), MSB2 (Condom used during first sexual intercourse), MSB4 (Condom used at last sexual intercourse), MHA7 (Number of non-regular partners) Seen in the small boxes pointed out from the HIV construct.

Figure 4.1: CFA Measurement Model Combining Poverty and HIV Simultaneously

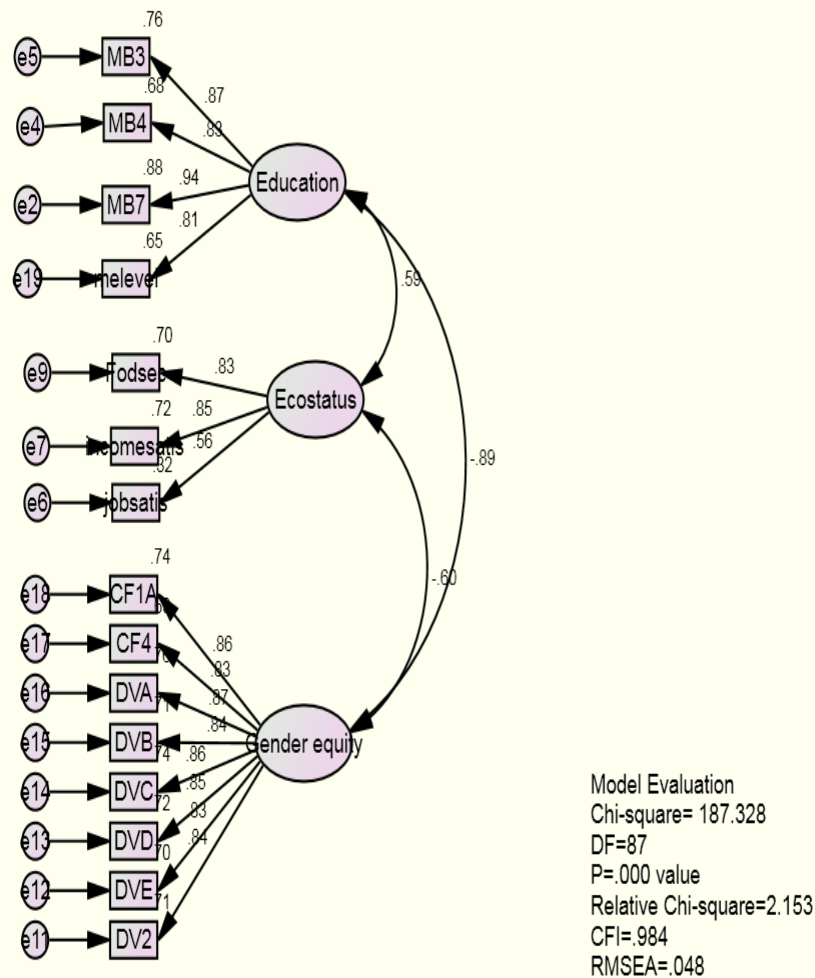
Table 4.4 Summary of the Model Fit Indices – Combining Poverty and HIV

Model	Chi-Square	Df	X^2/df	RMSEA	CFI
CFA	175.011	43	4.070	0.078	0.974

Source: SHHS (2010) results using AMOS Graphic Analysis

4.2.2.1.4 CFA for the Mediating Factors

In this section, the CFA procedure links the mediating constructs and examines whether these constructs are correlated. In order to achieve the construct validity and the factor loadings, the double-headed arrows in Figure 4.2 link the three mediating constructs of education, gender inequality, and economic status. Three items were deleted because the factor loading was low (less than 0.50). The model was re-specified, the fitness indexes were validated, and the required level was achieved (see Table 4.5).



Note:

Economic status measured by: Jobsat (employment status), Incomsat (income status), Fodsec (food consumption and security), (Seen in the small boxes pointed out from the economic status construct)

Gender inequality measured by: CF1A (whether accept circumcision), CF4 (whether circumcision practice should be continued), DVA (if wife goes out without telling her husband, beating justified), DVB (if wife neglects the children, beating justified), DVC (if argument with husband, beating justified), DVD (if refuses sex with husband, beating justified), DVE (if she burns the food, beating justified), DV2 (if he beat his wife last year for any reason). These variables are to measure violence and abuse against women, FGM and sex negotiation. (Seen in the small boxes pointed out from the gender inequality construct)

Level of education measured by: MB3 (school attendance), MB4 (level of school attended), MB7 (able to read or write, Mlevel (Level of education) (Seen in the small boxes pointed out from the gender inequality construct)

Source: SHHS (2010) results using AMOS Graphic Analysis

Figure 4.2: CFA Measurement of the Model between Mediating Factors

Table 4.5: Summary of the Model Fit Indices: Combining the Mediating factors

Model	Chi-Square	Df	X ² /df	RMSEA	CFI
CFA	187.328	87	2.153	0.048	0.984

Source: SHHS (2010) results using AMOS Graphic Analysis

All the items showed highly convergent validity as the Average Variance Extracted (AVE) was greater than 0.50 (see Table 4.6) and the composite reliability calculated was greater than 0.60. In brief, all the values of the individual constructs achieved the convergent validity, indicating that the data set had a high level of reliability and was sufficiently reliable for subsequent quantitative analysis.

Table 4.6: Summary of CFA for all Constructs in Structural Model (Men)

Constructs	Item	Factor Loading	CR (Above 0.6) $(\sum K)^2 / [(\sum K)^2 + (\sum 1 - K^2)]$	AVE (Above 0.5) $\sum K^2 / n$
Poverty	Wscore	0.93	0.933	0.874
	Windex	0.98		
	Mweight	0.94		
HIV	MHA2	0.64	0.912	0.647
	MHA4	0.76		
	MHA7	0.69		
	MHA8A	0.73		
	MHA8B	0.79		
	MHA8C	0.79		
	MSB2	0.83		
	MSB4	0.77		
Eco. Status	Fodsec	0.83	0.797	0.575
	Incomsat	0.85		
	Jobsat	0.56		
Education	MB3	0.87	0.839	0.723
	MB4	0.83		
	MB7	0.94		
	Mlevel	0.81		
Gender Eq.	CFIA	0.86	0.953	0.958
	CF4	0.83		
	DVA	0.87		
	DVB	0.84		
	DVC	0.86		
	DVD	0.85		
	DVE	0.83		
	DV2	0.84		

Note: Economic status measured by: Jobsat (employment status), Incomsat (income status), Fodsec (food consumption and security),

Gender inequality measured by: CFIA (whether accept circumcision), CF4 (whether circumcision practice should be continued), DVA (if wife goes out without telling her husband, beating justified), DVB (if wife neglects the children, beating justified), DVC (if argument with husband, beating justified), DVD (if refuses sex with husband, beating justified), DVE (if she burns the food, beating justified), DV2 (if he beat his wife last year for any reason). These variables are to measure violence and abuse against women, FGM and sex negotiation.

HIV measured by the following variables: MHA2 (Can avoid AIDS virus by having one infected partner), MHA4 (Can avoid the AIDS virus by using condom) MHA8A, MHA8B and MHA8C (knowledge of transmission of HIV from mother to her child during pregnancy, delivery and breast feeding respectively), MSB2 (Condom used during first sexual intercourse), MSB4 (Condom used at last sexual intercourse), MHA7 (Number of non-regular partners).

Level of education measured by: MB3 (school attendance), MB4 (level of school attended), MB7 (able to read or write, Mlevel (Level of education).

Poverty measured by Wscore (Wealth score), Windex (Wealth index), Mweight (men's wealth weight).

Source: SHHS (2010) results using SPSS software

4.2.2.1.5 Assessment of Normality of the Data

SEM analysis was used to estimate the direct and indirect effects of the independent variable (poverty) on HIV and the effects of the mediating factors on the poverty and HIV relationship. The hypothesised model was tested with AMOS software version 18 using the maximum likelihood estimation. The use of the univariate normality of each variable was tested by examining the skewness and kurtosis value (Hair et al., 2010).

The arithmetic mean is a good descriptor if the skewness value obtained was within ± 2.0 of the cut-off point (George & Mallery, 2003). For the kurtosis, the cut-off point of less than seven (7) is acceptable (Byrne, 2013). The skewedness and kurtosis values reported in Table 4.7 illustrate the normality of the variables. It shows that, all skewness values were less than two (2) and kurtosis values were less than seven (7). Since the variables were all normally distributed, the maximum-likelihood estimation procedure was used to analyse the measurement and structural models for the direct and indirect relationships in this study.

Table 4.7: Assessment of Normality for the Data

Construct	Variable	min	max	Skew.	c.r.	Kurtosis	c.r.
Poverty	Wealth score	-1.022	3.350	1.116	-1.055	-0.982	-4.484
	Wealth index	1.000	5.000	-0.285	-2.602	-1.013	-4.623
	Men weight	0.060	0.754	0.240	2.195	-1.294	-5.906
HIV	MHA2	1.000	5.000	-0.468	.4.275	-1.781	-8.128
	MHA4	1.000	5.000	0.006	0.057	-1.994	-9.103
	MHA7	1.000	5.000	-0.264	-2.412	-1.880	-8.583
	MHA8A	1.000	5.000	-0.290	-2.649	-1.889	-8.624
	MHA8B	1.000	5.000	-0.217	-1.978	-1.914	-8.735
	MHA8C	1.000	5.000	-0.214	-1.956	-1.915	-8.740
	MSB2	1.000	5.000	0.043	0.395	-1.955	-8.922
	MSB4	1.000	5.000	-0.136	-1.242	-1.934	-8.826
Eco. Status	Food Sec.	1.000	5.000	-0.325	-2.970	-1.185	-5.407
	Income status	1.000	5.000	-0.156	-1.421	-1.470	-6.708
	Job status	1.000	5.000	-0.211	-1.928	-1.419	-6.476
Education	MB3	1.000	4.000	-0.045	-0.410	-1.866	-8.517
	MB4	1.000	5.000	1.122	10.243	0.091	0.416
	MB7	1.000	5.000	0.239	2.182	-1.826	-8.335
	Melevel	1.000	5.000	0.245	2.232	-1.423	-6.496
Gender Inequality	CFIA	1.000	5.000	-0.026	-0.239	-1.919	-8.757
	CF4	1.000	5.000	0.074	0.674	-1.919	-8.760
	DVA	1.000	5.000	0.025	0.232	-1.921	-8.768
	DVB	1.000	5.000	0.144	1.314	-1.863	-8.502
	DVC	1.000	5.000	0.017	0.157	-1.868	-8.528
	DVD	1.000	5.000	0.064	0.588	-1.891	-8.631
	DVE	1.000	5.000	0.255	2.325	-1.804	-8.236
	DV2	1.000	5.000	-0.075	-0.687	-1.908	-8.709
	Multivariate					147.451	43.204

Note: refer to the note in Table 4.2 which defines the variables assessed in this Table

Source: SHHS (2010) results using AMOS Graphic Analysis

4.3 Analysis and Findings

This section presents the findings of the data analysis and tests the hypotheses stated in chapter 3. It shows the results of the Chi square and AMOS graphic analysis, and evaluates the assessment of the men's measurement model. It begins with describing the demographic characteristics of the respondents and the results of the chi square analysis using SPSS software from which the relationships between the variables are illustrated.

4.3.1 Demographic Data Analysis of Respondents from the SHHS Survey (Men):

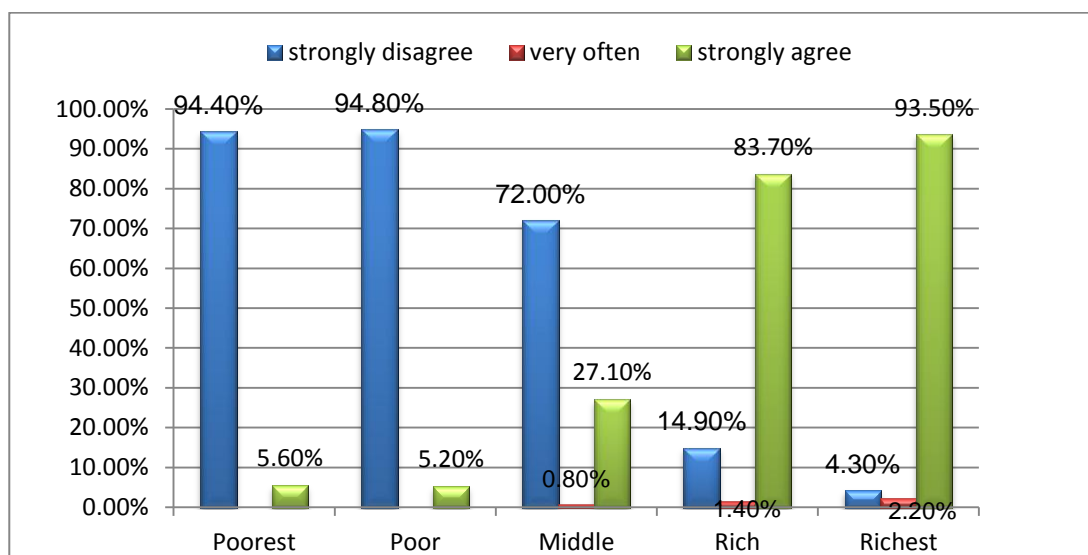
SPSS software was used to generate descriptive analysis of the respondents from the SHHS survey. The results showed that slightly more than 50 percent of the participants were urban residents, while 48 percent were rural inhabitants. All the respondents were between the ages of 15 to 49 years, and the median age of 32 years. The majority of the participants (60.4%) were married while the rest were either single, divorced, or widowed. Slightly over a third of respondents (34.2%) had no schooling, while 17.2 percent were educated at the primary level and 35.2 percent up to the secondary level. Approximately 32.2 percent were never employed (see Table 4.8). Figures 4.3, 4.4 and 4.5 show some of the results of the chi-square analysis from the household health survey on the relationships between poverty and HIV/AIDS among men. The details of the results are found in appendix (C).

Table 4.8: Summary of the Respondents' Characteristics (Men)
(Sample size 500)

Demographic Characteristics	Description	No of Respondents	Percentage
Area	Urban	260	52.0%
	Rural	240	48.0%
Age	15 – 19	91	18.2%
	20 – 24	63	12.6%
	25 – 29	70	14.0%
	30 – 34	80	16.0 %
	35 – 39	74	14.8%
	40 – 44	55	11.0 %
	45 – 49	67	13.4%
Education	None	171	34.2%
	Primary	86	17.2%
	Secondary	176	35.2%
	University	67	13.4%
Marital status	Formerly married	302	60.4%
	Divorced	154	30.8%
	Separated	1	0.2%
	Never married	45	8.6%
Employment status	Never employed	161	32.2%
	Currently not employed	52	10.4%
	Inconsistent job	24	4.8%
	Currently employed	52	10.4%
	Employed	211	42.2%
Wealth Index	Poorer	148	29.6%
	Middle	118	23.6%
	Fourth	141	28.2%
	Rich	93	18.6%

Source: SHHS (2010) results using SPSS software

Figure 4.3 shows the relationship between poverty and of knowledge about condom use among men in the household survey. The respondents were asked if they could avoid HIV through the correct and consistent use of condoms. More than 90 percent of the men from poor resource settings disagreed, while the majority of the wealthy agreed. These results indicate that wealthy people have better knowledge of condom use as a protective method against HIV than the poor.

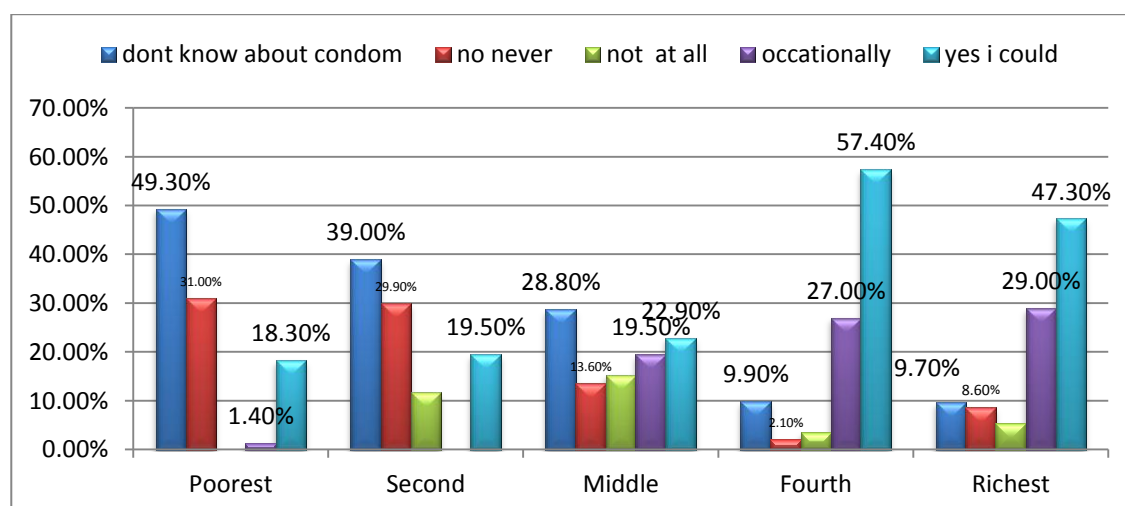


Source: SHHS (2010) results using SPSS software

Note: See the details of the Chi-Square analysis and the p-value results in appendix (C)

Figure 4.3: Relationship between Condom use and Wealth Index

Figure 4.4 shows the relationship between poverty and the ability to procure condoms. Respondents were asked if they are able to acquire or buy condoms. The majority of the wealthy respondents (78.8%) mentioned they could get condoms compared with only 3.3 percent of the poor. This indicates that people from rich segments of the society have better chances to protect themselves against HIV.

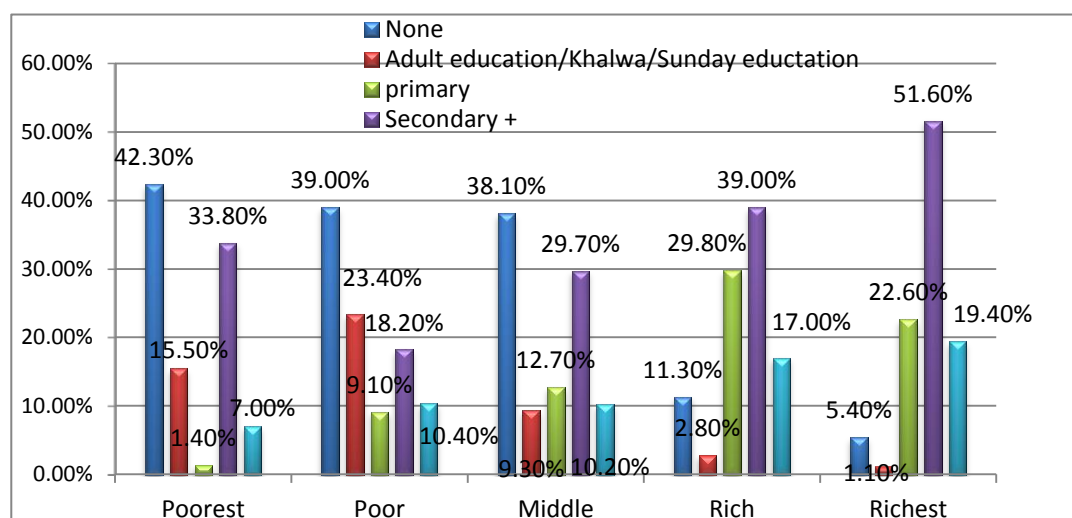


Source: SHHS (2010) results using SPSS software

Note: See the details of the Chi-Square analysis and the p-value results in appendix (C)

Figure 4.4 Relationship between Wealth Index and The ability to procure Condom

Figure 4.5 shows the relationship between poverty and level of education. The results indicated that the wealthy have better opportunities in terms of educational attainment.



Source: SHHS (2010) results using SPSS software

Note: See the details of the Chi-Square analysis and the p-value results in appendix (C)

Figure 4.5: Relationship between Level of Education and Wealth index

4.3.2 The Full Structural Model

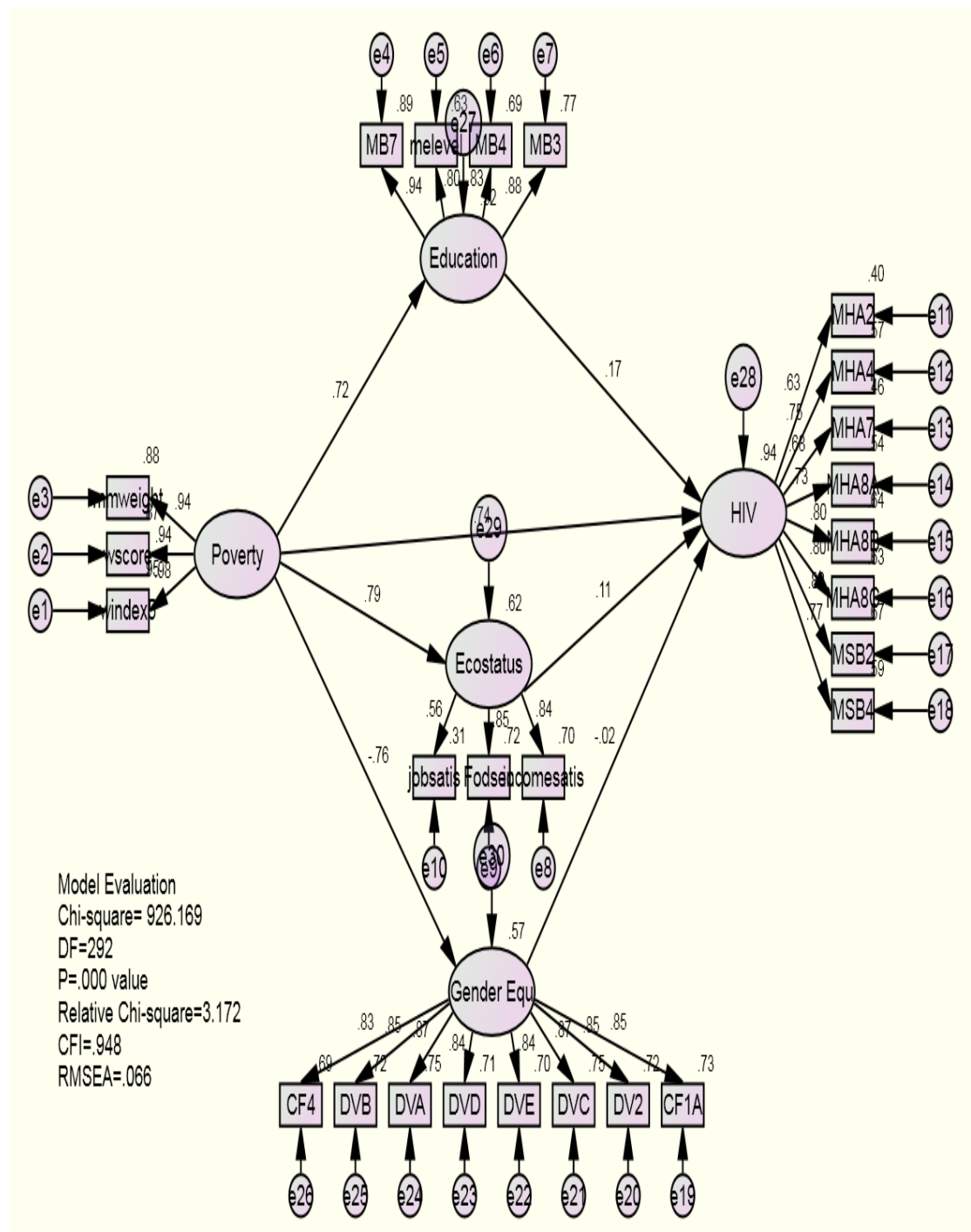
Table 4.9 shows that the comparative fit index (CFI) equals to 0.948, which is > 0.90, and chi-square/df equals to 3.172, which is less than five (5). The root mean square of error approximation (RMSEA) equals 0.066, which is less than 0.08. The chi-square is 0.000, which is less than 0.0001. This indicates that the model employed in the study fits the data and fulfils the requirement for analysis. In Figure 4.6, the model shows that the independent construct (Poverty) measured by wealth index, wealth scores and weights significantly predict the three mediating factors (low economic status, low level of education, and gender inequality). In addition, poverty is significantly and directly related to the dependent variable (HIV). This indicates that there is a significant relationship between poverty with its associated factors and HIV.

Moreover, the results indicate that the mediating factors have a positive effect on the relationship between poverty and HIV.

Table 4.9 Summary of the Full Structural Model Fit Indices

Model	Chi-Square	Df	X^2/df	RMSEA	CFI
Full model	926.169	292	3.172	0.066	0.948

Source: SHHS (2010) results using AMOS Graphic Analysis



Source: SHHS (2010) results using AMOS Graphic Analysis

Figure 4.6: The Full Structural Model of the Inter-relationships between Constructs

The results in Table 4.10 show the standardised regression weights. For the full structural model, the results show a significant direct relationship between poverty and HIV ($\beta = 0.711$, $P < 0.001$), suggesting that the direct effect condition is satisfied. In

addition, the findings from the full model structure shows that poverty is a significant predictor for low levels of education, low economic status, and gender inequality. Hence, poverty was found to be a predictor for HIV.

The path coefficients in this model indicate that low economic status, low level of education, and gender inequality are significantly linked to HIV. Thus, the results of the full structural model indicated that there is a positive and significant relationship among all five constructs. Overall, the results suggest that the perception of poverty and its associated factors are significantly related and strongly influence the possibility of increased HIV.

The results suggest that the conditions of poverty in Sudan lead to lack of educational opportunities, low economic status in terms of unemployment, low income, and no satisfaction with job status and food consumption. Furthermore, gender inequality between men and women in terms of abuse against women led to an increased sense of being powerless among women. All these factors may render people in Sudan at greater risk of vulnerability to HIV via the economically driven adoption of risky behaviours that increase risk taking such as engaging in unprotected sexual contacts, a high rate of partners, lack of information about HIV prevention methods such as the use of condoms, and not being unfaithful to an uninfected partner.

Table 4.10: Standardised Regression Weights of the Full Structural Model

Relationship	Estimate	S.E.	C.R.	P-value	Result
Education ← Poverty	0.969	0.048	20.209	***	Significant
Ecostatus ← Poverty	0.783	0.040	19.547	***	Significant
Gender Eq. ← Poverty	0.965	0.049	-19.733	***	Significant
HIV ← Poverty	0.711	0.059	12.048	***	Significant
HIV ← Low education	0.121	0.028	4.325	***	Significant
HIV ← Low Ecostatus	0.108	0.037	2.936	0.003	Significant
HIV ← Gender Ineq.	0.015	0.030	-0.518	0.005	Significant
Windex ← Poverty	1.000				Significant
Wscore ← Poverty	0.979	0.020	4.224	***	Significant
Mweight ← Poverty	0.168	0.003	50.906	***	Significant
MB7 ← Education	1.000				Significant
Melevel ← Education	0.672	0.027	24.895	***	Significant
MB4 ← Education	0.572	0.021	24.895	***	Significant
MB3 ← Education	0.719	0.022	32.063	***	Significant
Incomstatus ← Ecostatus	1.000				Significant
Foodstatus ← Ecostatus	0.932	0.046	20.048	***	Significant
Job status ← Ecostatus	0.663	0.052	12.666	***	Significant
MHA2 ← HIV	1.000				Significant
MHA4 ← HIV	1.226	0.085	14.453	***	Significant
MHA7 ← HIV	1.064	0.080	13.300	***	Significant
MHA8A ← HIV	1.164	0.082	14.188	***	Significant
MHA8B ← HIV	1.266	0.084	15.037	***	Significant
MHA8C ← HIV	1.257	0.084	14.981	***	Significant
MSB2 ← HIV	1.305	0.085	15.347	***	Significant
MSB4 ← HIV	1.222	0.083	14.637	***	Significant
CFIA ← Gender Eq.	1.000				Significant
DV2 ← Gender Eq.	0.997	0.041	24.605	***	Significant
DVC ← Gender Eq.	0.985	0.038	25.630	***	Significant
DVE ← Gender Eq.	0.954	0.039	24.281	***	Significant
DVD ← Gender Eq.	0.978	0.040	24.524	***	Significant
DVA ← Gender Eq.	1.018	0.039	25.826	***	Significant
DVB ← Gender Eq.	0.975	0.039	24.737	***	Significant
CF4 ← Gender Eq.	0.977	0.041	23.972	***	Significant

Note:

*** indicate a highly significant at < 0.001, less than 0.005 is significant

The Arrows ← indicated the path relationships between the all constructs and variables.

Estimate = 1.000 means that the regression weight is fixed, indicated that the relationship between the each two variables has the same effect.

Source: SHHS (2010) results using AMOS Graphic analysis

4.3.3 Direct Relationship, Full Mediation and Partial Mediation

A mediator is a variable that specifies the association between an independent variable and an outcome variable (dependent variable). A mediator effect is tested only when there is significant direct effect between the independent variable and the dependent variable. In other words, the mediating relationships occur when a third variable (mediator) plays an important role in the prevailing relationship between the independent and dependent variables. However, there is a possibility that a mediator variable conceptually plays a role in governing the relationship between the two variables (Baron & Kenny, 1986). If the relationship between the independent variable and the outcome variable is statistically significant and strong, the researcher is likely to be interested in finding a mediator that explains how or why the independent variable predicts the outcome (Bennett, 2000).

In linking poverty and HIV in Sudan, the study models the mediating effect of low level of education, gender inequality, and low economic status. Baron & Kenny (1986) argued that the approach is in using a series of regression models to test the meditational hypotheses. This is achieved by:

Firstly, regressing the independent variable on the mediator variable.

Secondly, regressing the mediator on the independent variable.

Thirdly, regressing the dependent variable on the mediator.

Fourthly, regressing the independent variables on the dependent variable.

Fifthly, regressing the dependent variable on both the independent variables and the mediator.

The following are the four conditions for establishing mediation:

- (1) The independent variable significantly affects the dependent variable.
- (2) The independent variable significantly affects the mediator.

- (3) The mediator significantly affects the dependent variable.
- (4) The effect of the independent variable on the dependent variable shrinks upon the addition of the mediator to the model.

Complete mediation occurs if the independent variable does not affect the dependent variable upon regression of the dependent variable on both the independent variable and the mediator. Otherwise, the test supports partial mediation.

4.4. Hypotheses Testing

The research questions illustrated in chapter 1 address the effects of three mediating variables occurring between the relationships of poverty (independent variable) with HIV (dependent variable). A number of relationships are predicted among the constructs. In order to test these relationships, the analysis process started by examining the relationship between poverty and HIV. If a significant relationship is confirmed, this means we should reject the null hypothesis (H_0) (This hypothesis proposes that no statistical significance exists in a set of given observations and show that no variations exists between the variables) and accept the alternative hypothesis (H_1), which states the opposite and that indicates the exist of significance relationship.

4.4.1 Relationship between Poverty and HIV

The analysis procedure started by testing the direct effect between poverty and HIV. The model tested confirmed this relationship (see appendix (E)). Zainudin (2013) argued that if this relationship tested significant, then the effect of the mediation factors would be reduced. The results in Table 4.11 show that the hypothesis suggests that poverty directly influences HIV, with a significant positive relationship identified.

The standardised parameter estimate was 5.589 with a CR of 16.676 (P value less than 0.001). The probability of getting a critical ratio as large as 16.676 in absolute value is zero, indicating that the regression weights for poverty in predicting HIV is significant at less than 0.001 level (two -tailed). In other words, the regression weights for poverty in predicting HIV is significant. The results show that the relationship between poverty and HIV is estimated at 5.589, meaning that when poverty increases by 1, the spread of HIV increases by 5.589. This indicates that any increase in poverty contributes to the spread of HIV.

Table 4.11: Direct Effects of Poverty on HIV

Relationship	Estimate	S.E.	C.R.	P-value	Result
HIV ←----- Poverty	5.589	0.335	16.676	***	Significant
Men weight ←----- Poverty	1.000			***	Significant
Wealth index5 ←----- Poverty	5.975	0.115	51.481	***	Significant
Wealth score ←----- Poverty	5.819	0.140	41.690	***	Significant
MHA2 ←----- HIV	1.000			***	Significant
MHA4 ←----- HIV	1.214	0.083	14.679	***	Significant
MHA7 ←----- HIV	1.060	0.078	13.554	***	Significant
MHA8A ←----- HIV	1.144	0.080	14.339	***	Significant
MHA8B ←----- HIV	1.224	0.081	15.026	***	Significant
MHA8C ←----- HIV	1.223	0.081	15.042	***	Significant
MSB2 ←----- HIV	1.293	0.083	15.607	***	Significant
MSB4 ←----- HIV	1.209	0.081	14.844	***	Significant

Note: *** indicate a highly significant at < 0.001

The Arrows ←-----indicated the path relationships between the all constructs and variables.

Estimate = 1.000 means that the regression weight is fixed, indicated that the relationship between the each two variables has the same effect Source: SHHS (2010) results using AMOS Graphic analysis

The results achieved the purpose of this study and were consistent with several studies thereby supporting the relationship between poverty and HIV (Whiteside, 2001; Barnett. & Whiteside, 2002; Booyesen & Bachmann, 2002; Booyesen, 2004; Whiteside & Sunter, 2000; Wojcicki, 2005). Poverty is characterised by lack of financial and

human resources that increase vulnerability to HIV by engaging in unprotected sexual contacts in such conditions as sex work, teenage marriage, and lack of negotiation in sex among women and other traditional practises such as FGM (Cohen, 2006; Mbirimtengerenji, 2007). The findings were in line with the drive theory which advances that human behaviours were driven by poor conditions shaped by a general inability to fulfil their needs.

These findings indicated that the poverty was associated with exposure to cumulative, adverse, physical, and social stressors, as shared by Evans and Migule (2007). This provides robust support for the contention that poverty is a significant risk factor for HIV and wealth does not significantly contribute toward exposing people in Sudan to HIV- risk.

It should be confirmed that wealth has a positive effect on the accuracy of HIV/AIDS knowledge, and a highly significant negative effect on the probability of a given respondent answering “I don’t know” when asked about the modes of transmission of HIV and use of condom as a preventative method. This indicates that the proportion of men and women aged 15-49 years who can avoid AIDS by using one infected partner, have knowledge regarding modes of transmission of the HIV virus, using condoms correctly every time, and having the ability to procure condoms as a protected method against HIV appears to increase with their wealth index (see appendix C).

The results also show that the proportion of men who have sex with one or more paid sexual partners or are more likely to have sexual contacts with non-regular partners appears to decrease with a higher wealth index. The most striking behaviour pattern can be seen in the association between HIV prevalence and the proportion of men who report visiting sex workers (see figure 18 in appendix C). The result shows that 57.7 percent of the poorest have sexual contact with more than one paid female sex

workers compared with only 30.1 percent of the richest respondents, which implies the increased vulnerability for those men to HIV. This result suggests that some married women, despite exhibiting least risky behaviour, are at risk because their partners are current or former clients of sex workers.

In Sudan, the risk of HIV has been found to be higher among most at risk population such as FSWs who engage in sex work to meet their financial needs and vulnerable groups such as truck drivers, soldiers, and amongst migrants in search of better incomes (Abdalrahheim, 2010), in addition to those internally displaced due to war and conflict (SNAP, 2010). Decades of war in Mozambique increased child prostitution and increased HIV risks (Hankins et al., 2002). With the continuous civil war in Sudan, the country is experiencing increased exposure to HIV, especially among the more vulnerable segments of the society.

Wars and conflict in Darfur have forced men to stay away from their wives for a long time, which may result in some of them exploiting the opportunity to engage in unsafe and unprotected sexual practices including the use of sex workers. On their return home, they transmit the virus to their wives. The spread is confounded through polygamy, which is widely practiced in Sudan (SHHS, 2006), as women are not in a position to negotiate safe sex or prevent their partners from having additional sexual contacts. The risk of infection becomes greater with severe consequences (Parikh, 2007).

The study suggests that most of poor people struggle for daily sustenance. They put in more work hours in hard labour compared to the rich and established. Hence, the richer indulge in premeditated sexual habits. This affords them the opportunity to prepare for it including securing venues and quality condoms. The poor on the other hand indulge in opportunistic sex at odd times and places. Hence, no earlier protective




plans are found at such instances. This situation applies to those who indulge in sexual activities with people other than their legally approved partners.

4.4.2 Relationship between Economic Status and HIV

The second model shows the effects of the mediating factor (economic status) (See appendix D). Hypothesis 1 illustrated in chapter 3, stated that HIV is expected to be positively associated with low economic status and negatively associated with wealth. The results show a significant relationship between low economic status as a characteristic of poverty and HIV. All the fitness indexes achieved the required levels. The results in Table 4.12 show that the relationship between economic status and HIV is estimated at 0.197, meaning that when poverty increases, economic status reduces by one (1) and HIV increases by 0.197.

This indicates that a decrease in economic status leads to increased HIV prevalence. The probability of getting a critical ratio as large as 3.186 in absolute value is less than 0.001, indicating that the regression weights of low economic status in predicting HIV is significantly different from zero at the 0.001 level (two-tailed). This indicates that the alternative hypothesis (H_1) is confirmed, indicating evidence of a significant positive relationship. Thus, the test proves that economic status is a significant mediator in the relationship between poverty and HIV.

Table 4.12: Hypothesis Testing of the Casual Relationship between Low Economic Status and HIV

Relationship	Beta Estimate	S.E.	C.R.	P-value	Result
Economic Status  Poverty	3.088	0.256	12.056	***	Significant
HIV  Poverty	5.002	0.357	14.023	***	Significant
HIV  Low economic status	0.197	0.062	3.186	***	Significant

Note: The arrows indicate the relationships between the variables

*** indicate a highly significant at < 0.001

Source: SHHS (2010) results using AMOS Graphic analysis

This hypothesis was fully supported in that low economic status was found to be an important predictor for HIV in Sudan. The hypothesis test from the AMOS graphic results showed that poor men were more exposed to HIV compared to the richer segments of the society in terms of employment status, food security, income status, and the ability to procure condom as a protective method against HIV. Given these strong results, the hypothesis stated that low economic status exposed people to a high-risk of HIV could not be rejected. This result fully achieved objective one of the present study that low economic status in Sudan causes greater vulnerability to HIV.

The results are consistent with the reviewed literature that shows convincing practical evidence of the relationship between low economic status and HIV (Luke, 2005; Collins & Rau, 2000; Booysen & Bachmann, 2002; Wojcicki, 2005). These findings were supported by the results from the FGDs among PLHIV.

An instance of this is the quote by a 42-year old man,

“...Low income and my responsibility as the eldest in the household forced me to migrate to increase my income and face the responsibility of covering the educational expenses for my younger sister and two brothers, besides payment of monthly rental of our house, due to the death of my father. The shocks and stresses due to the heavy burden dragged me to engage in illegal sexual contact that most probably led to my infection and rejection from my job.”

When respondents in the FGDs were asked about the availability of facilities and services such as accessibility to water, toilets, electric power and cooking utensils within their households, the majority of the respondents said “nothing”, whilst the rest said “no water”, indicating their poor status. In addition, natural disasters, floods leading to vagrancy of families, and other circumstances increases vulnerability to HIV.

The study suggests that men from richer segments of society were able to protect themselves better from engaging in high-risk behaviours because they have more resources and acquired better knowledge concerning HIV prevention, especially

through the constant and correct use of condoms. They also possess the resources to promptly access quality healthcare (Gillespie et al., 2007).

However, emphasis has been placed on the direct effect of declining income, poor nutrition conditions, and unemployment status on the vulnerability of individuals and communities to HIV (Stillwagon, 2006). The results show that approximately 78.8 percent of the male respondents who are highly satisfied with their employment status are the most likely to be faithful to one infected partner to avoid HIV risk. The results of this thesis provides evidence that shows that interventions targeted at the poor and the less advantaged can be effective in reducing the spread of HIV.

The growing income inequalities and increasing urban informal sector accounts for more than 60 percent of GDP in Sudan. The results show that 78.3 percent of Sudanese men satisfied with their income status are more likely to use condoms as a preventive method compared with 18.2 percent of those unsatisfied. Socio-economic conditions such as tribal clashes in some areas in Sudan causes many people to leave their homes and become migrants or refugees especially from Darfur (West of Sudan), South Kordofan and Blue Nile. This reduces their ability to sustain themselves resulting in poorer conditions leading them to engage in risky behaviours associated with HIV such as earlier initiation of sexual activity, using non-regular sexual partners, and less frequent use of condoms.

In addition, the results show that 85 percent from the richest segments of the society are satisfied with their food consumption compared to 23.5 percent from the poor (see appendix C). , all of these poverty related conditions decrease resistance to disease in general and to HIV in particular. The 2010 SHHS2 data relating to the proportion of moderately and severely food insecure households also indicated that households in the poorest quintile are more likely to be food insecure or vulnerable

than households in the richest quintiles. A specific focus on protecting and promoting access to food may thus decrease exposure to HIV, especially among women.

Overt malnutrition is widespread in Sudan where nutrition is poor (UNDP, 2012). Moreover, nutrition is a key determinant for reducing adherence to anti-retroviral drugs. Poverty is therefore a risk factor for food insufficiency, which increases mortality rates and gives way to opportunistic infections (Weiser et al., 2012).

Thus, the study suggest that in addition to include these variables, it is important that future researches should consider migration as a results of food insufficiently and unemployment, which previous studies found to be an important predictor in the spread of HIV (Mbirimtengerenji, 2007; Collins & Rau, 2000; Greener & Sarkar, 2010; Smith, 2007).

4.4.3 Relationship between Education and HIV

Hypothesis 2 in chapter 3 illustrated that low levels of education increases risk of HIV, suggesting that the poor segments of society who lacked the minimum education level in Sudan are more exposed to HIV. The model shows that all the fitness indexes achieved the required levels (see appendix D).

The results in Table 4.13 support Hypothesis 2 suggesting that low levels of education are positive and significantly related to HIV. The standardised parameter estimate was 0.231 with a CR of 6.830 (P-value less than 0.001). The probability of getting a critical ratio as large as 6.830 in absolute value is zero. In other words, the regression weights for low education level in predicting HIV is significantly different from zero at the 0.000 level, indicating that low level of education has a significant direct effect on the risk of contracting HIV.

The results show that the relationship between low level of education and HIV is estimated at 0.231, meaning that when low level of education is worsened by one (1), the risk of HIV increases by 0.231. This indicates that poorly educated people lacked the knowledge concerning HIV prevention which exposed them to the risk of HIV more than educated people. Given these results, this hypothesis cannot be rejected. These findings are consistent with several studies (Tladi, 2006; Fako, 2010; Walque, 2005; Hargreaves et al., 2007; Glynn et al., 2004; Gregson et al., 2001).

The results in sections 4.4.3 and 5.5.4 support the existence of a robust, highly positive, and significant possibility of illiterate males being infected with HIV. The results indicate that the proportion of men within the 15-49 age group who were not educated, do not have the ability to read or write or educated up to primarily school level, appear to be more exposed to HIV than the educated. As these variables show significant interactions with HIV measured variables such as non-use of condom, lack of knowledge regarding HIV modes of transmission, having non-regular sexual contacts, and being unfaithful to an uninfected partner.

This study provides significant empirical evidence of the importance of education in reducing the spread of HIV by avoiding HIV risk through using condoms, adherence to one non-infected partner, and avoiding sexual contact with irregular partners and high-risk populations, since the ability to read is dependent on education.

The results show that 42.3 percent of men from poor segments of the society are not educated compared with only 5.4 percent of the rich. In addition, approximately 93.5 percent of rich men who responded in the household survey strongly agreed with using condoms correctly to avoid HIV compared with only 5.6 percent of the poor (see appendix C) which indicates their low knowledge of HIV/AIDS. As with knowledge of the effective means of avoiding HIV, the chances of having used a condom during first and last sexual intercourse improved with an increase in the level of education attained.

It also supports the findings from previous studies that show a negative relationship between education and HIV (Jere, 2012; Hargreaves et al., 2007; Tladi, 2006). UNICEF (2004) reported that lack of formal schooling and high level of youth unemployment in Sudan are turning the potentially young generation from an asset into threats for the future. The results of the PLHIV survey indicate that lack of finance to pay school fees and procure relevant resource materials often disrupts children's schooling. This severely affects their educational attainments and prospective employment opportunities.

The quantitative and qualitative findings of this study show that the majority of the poor and uneducated people either lacked knowledge about condoms or were not able to procure it. This indicates that wealthy and educated people have better knowledge of condom use as protective sexual behaviour against HIV than the poor and uneducated. From a policy and practice perspective, the study suggests extensive awareness raising campaigns on condom use as important and effective method towards decreased HIV prevalence in Sudan. Another important variable that indicates a lack of knowledge about HIV transmission from mother to her child through pregnancy, delivery and breast feeding, as all these variables showed significant relationships with lack of education, which increased the risk of high prevalence among new generations and shape their future.

The literature showed low knowledge about HIV in Sudan. A study conducted in six states of Central, Eastern and Northern Sudan found that 52 percent of the people in rural areas still do not have an adequate amount of knowledge about HIV transmission and methods of prevention (Khamis, 2013). Concerning this, the qualitative findings show that the majority of the participants in the FGDs were not willing to disclose their HIV status due to erroneous beliefs concerning the disease and its modes of transmission. The study suggests that from a policy and practice

perspective, it is vital to find ways to break the culture of silence surrounding the disease.

Table 4.13: The Hypothesis Testing of the Casual Relationship between Low level of Education and HIV

Relationship	Beta Estimate	S.E.	C.R.	P-value	Result
Low level of ducation → Poverty	0.632	0.038	16.474	***	Significant
HIV ← Poverty	0.772	0.052	14.808	***	Significant
HIV ← Low Education	0.231	0.034	6.830	***	Significant

Note: The arrows indicating the relationships between the variables

Source: SHHS (2010) results using AMOS Graphic analysis

The findings of this study show that education is a confirmed protective against HIV risk, and the interaction effects between education and wealth can be highly significant when people have resources. The ability to use these resources enables people to have the right and power to shape their environment and to develop effective risk assessment so that they can act on safeguarding their sexual health and sustainable livelihood.

The assumption here is that people with the necessary educational qualifications, resulting in economic independence/freedom for survival, better equip themselves against irrational and risky behaviour than those with limited education (Coombe & Kelly, 2001). This can be done by acquiring the minimum knowledge about use of condoms and avoiding unprotected sexual contacts with multiple partners. Thus, the findings fully achieved objective two, which stated that low levels of education increases vulnerabilities to HIV-high risk behaviours among Sudanese.

4.4.4. Relationship between Gender Inequality and HIV

The third hypothesis demonstrated in chapter 3 assumed that gender inequality leads to lack of power for women and exposed them to HIV risk. The model shows that

all the fitness indexes achieved the required levels. The results in Table 4.14 show that hypothesis 3 suggests that gender inequality directly contributes to increase HIV, with a significant positive relationship identified and supported. The standardised parameter estimate was 0.128 with a CR of 5.184 (P-value less than 0.001).

The results show that the probability of getting a critical ratio as large as 5.184 (0.128/0.025) in absolute value is zero. In other words, the regression weights for gender inequality in predicting HIV is significantly different from zero at <0.001 level (Two tailed). The results show that the relationship between gender inequality and HIV is estimated at 0.128, meaning that when the gender inequality increases by one (1), HIV increases by 0.128. Therefore, the finding shows direct positive and significant relationship between gender inequality and HIV. A number of questions were asked for the purpose of understanding gender inequality roles among men. The study suggests that some of the Sudanese men are likely to act in a way that leads to an increased sense of powerlessness among women consequently increasing their vulnerability to numerous social problems, including diseases such as HIV/AIDS. Thus, the findings of this study achieved objective three, which stated that poverty indicated by gender inequality increased women's vulnerabilities to HIV. The findings are consistent with several studies (Kemboi et al., 2011; Giulia et al., 2009; Masangala, 2007).

According to the variables used in this study that measure gender inequality, the hypothesis test shows that poor men widely accept gender inequality practises such as abuse against women including women battery, lack of sex negotiation, and persistent female genital mutilation. Gender disparities in terms of access to education, resources, income, and political power serve to increase the risk potential of HIV to women through unprotected sexual intercourse.

Table 4.14 Hypothesis Testing of the Casual Relationship between Gender**Inequality and HIV**

Relationship	Beta Estimate	S.E.	C.R.	P-value	Result
Gender Inequality → Poverty	0.943	0.049	19.271	***	Significant
HIV ← Poverty	0.809	0.054	14.949	***	Significant
HIV ← Gender Inequality	0.128	0.025	5.184	***	Significant

Note: The arrows show the relationships between the variables

Source: SHHS (2010) results using AMOS Graphic analysis

The focus group discussions among PLHIV supported these results. The majority of the participants mentioned gender inequality as an important social factor exposing people to HIV. In addition, the finding from the PLHIV survey found that about 40.6 percent of the total respondents had more than one wife. This study suggests that even in the context of marriage, especially where formalised polygamy is widely common as is the case in Sudan (SHHS, 2006). Some men may engage in risky sexual contacts and transmit the virus to their wives. See the quote below extracted from the FGDs.

A 47 years old man spoke out saying:

“I was probably infected with HIV during the several years I spent working as a construction worker in Addis Ababa. I was isolated from my wife and two children for seven years and migrated first to Addis Ababa, where I found a regular girlfriend, and had sex with female sex workers when going out with friends and had several irregular commercial sexual partners in the city. It is possible that my multiple sexual contacts resulted in my infection with HIV.”

In addition, the majority of the respondents from the FGDs accepted circumcision practices and the rest encouraged circumcision practices to be continued indicating a traditional view of violence against women in Sudan. To gain insight into factors associated with increased risk of HIV, participants in the FGDs were asked to mention any cultural or traditional practices that may expose people to HIV. Participants mentioned different kinds of traditional practices in Sudan. Approximately

26.7 percent mentioned women selling tea in the streets to gain income. Others mentioned FGM, which are procedures involving the partial or total removal of the external female genitalia. This procedure may carry the risk of using non-antiseptic and unclean instruments.

Cultural gender inequalities as well as patriarchal gender rules play a major role in the spread of HIV. Some inherent cultural belief has presented Sudanese men with the opportunity to evade responsibility for their sexually oppressive behaviour and unequal decision making which has proven to contribute to HIV risk factors mainly for women (Shannon et al. 2012). This becomes clear when weighted against the fact that most African countries including Sudan, there are highly unequal gender expectations. One of these hinges most on fidelity. Here, the extramarital sex of married men can be freely pardoned and/or accepted. In some places, this is even socially rewarded (Smith, 2007).

4.5 Summary

This study provides empirical evidence of the significant relationship between poverty and its mediating factors low economic status, low level of education, and gender inequality, with HIV/AIDS in Sudan. This chapter answered research questions 1, 2, and 3 as outlined in chapter 1. The findings in section 4.4.1 and Table 4.11 show significant statistical AMOS graphic analyses that poverty is predictor for HIV. Poverty indicated by wealth index and scores were found to be a significant predictor of HIV, as wealthier individuals are likely to be more aware of HIV prevention methods and have the ability to afford condoms to engage in protected sex and are more likely to avoid sexual contacts with irregular partners.

The poor people in Sudan are the ones at high risk of exposure to HIV associated with high rates of illiteracy, low income, and unemployment. The research

on these finding spans many disciplines (Lopman et al., 2007; Mishra et al., 2007; Byron, 2007; Batteh et al., 2008), which show that poverty increases the risk of HIV. The rational justification suggested that wealthier people tend to be more educated and are equipped with better knowledge on HIV prevention methods. The findings indicate that more than 90 percent of the poor people are not aware about condom use as a protective method against HIV. The wealthier also have better access to reproductive healthcare such as family planning, antenatal care, and measures to protect themselves against sexually transmitted diseases compared to the poor.

Moreover, the results in Table 4.12 provide empirical findings that show significant direct relationships between all the variables associated with low economic status such as low employment rate, low income, and insufficient food as the key factors that increase people's vulnerabilities to HIV. The findings in Table 4.13 also reveal that there is a significant relationship between lower levels of education and increased risk for HIV. The majority of the uneducated people are not aware about condom use as a protective method against HIV. This result gives a strong indication that high level of educational attainment drastically reduces HIV prevalence in Sudan.

Table 4.14 shows that gender imbalances are the driving force behind HIV. HIV is mainly acquired through heterosexual contacts, which are mainly influenced by socio-cultural factors associated with gender power imbalances. Abuse against women includes any act of gender-based violence that results in physical, psychological, sexual harm, or suffering to women (Kaye, D.K., 2004). The gender inequality variables used in the study such as encouraging FGM, abuse and domestic violence, and restricting women's capability to negotiate safer sexual practices such as condom use, show that some Sudanese men act in a way that increases women's vulnerabilities. Such unequal power relations increases women's risk and exposure to HIV (Garcia-Moreno & Watts, 2000).

CHAPTER 5

Impact of Poverty on HIV/AIDS among Women in Sudan: Findings from the 2010 Sudan Household Health Survey

5.1 Introduction

This chapter examines the impact of poverty on HIV/AIDS among women in Sudan, focusing particularly on vulnerability to HIV risks. It aims at empirically studying the relationship between poverty and HIV/AIDS among women, and ascertain whether this relationship occurs directly or indirectly through the three main mediating factors of low economic status, low level of education, and gender inequality. This chapter covers the quantitative elements of the national survey data sourced from the 2010 Sudan Household Health Survey. It uses the same statistical methods used in chapter four.

This chapter is organised into sections. Section 5.2 reviews the method and data treatment, it also illustrates the statistical and analysis methods used for the survey data. Section 5.3 discusses the analysis of the findings including the socio-economic demographic results. Section 5.4 tests and discusses the results to accept or reject the hypotheses illustrated in chapter 3. Sub-section 5.4.1 describes whether there are significant relationships between poverty and HIV among women, and whether poverty increases women's vulnerability to HIV. Sub-section 5.4.2 investigates whether lack of education may be a predicting factor for HIV risk. Sub-section 5.4.3 examines gender inequality exposure of women to HIV. Sub-section 5.4.4 investigates whether low economic status may increase women's vulnerability to HIV- risk. Section 5.5 provides a brief summary for the chapter.

The study will assess whether the findings are consistent with the theories adopted in this study and in answering the research questions outlined in chapter 1. It also discusses and investigates the results from the data analysis carried out to test the first three hypotheses outlined in chapter 3. Section 5.6 summarises the findings and concludes the chapter.

5.2 Method and Data Treatment

This study selected a randomly sample of approximately 500 from women who responded to the survey with complete and no missing data (See section 4.2).

5.2.1 Statistical Analysis Method

This chapter uses identical statistical techniques and measurement methods of the variables similar to that applied in analysing the data for men in chapter 4. The results of the analysis presented in this chapter will be discussed and the results of the AMOS graphic analysis is evaluated to validate the assessment of the model.

5.2.1.1 Assessment of the Measurement Model: Validity and Reliability

5.2.1.1.1 Internal Reliability

Table 5.1 shows that the alpha coefficient obtained in this study was high for the five constructs in the model. Cronbach's alpha coefficient estimates for the five constructs of poverty, HIV, economic status, gender inequality, and education were within the ranges 0.807 and 0.933. The results show that all the items in the instrument scored greater than 0.7, indicating achievement of the internal reliability.

Table 5.1: Internal Reliability of the Measurement Model

Construct	Items	Cronbach Alpha ≥ 0.70
Poverty	3	0.807
HIV	9	0.933
Education	5	0.888
Economic Status	5	0.807
Gender Inequality	7	0.889

Source: SHHS (2010) results using SPSS software

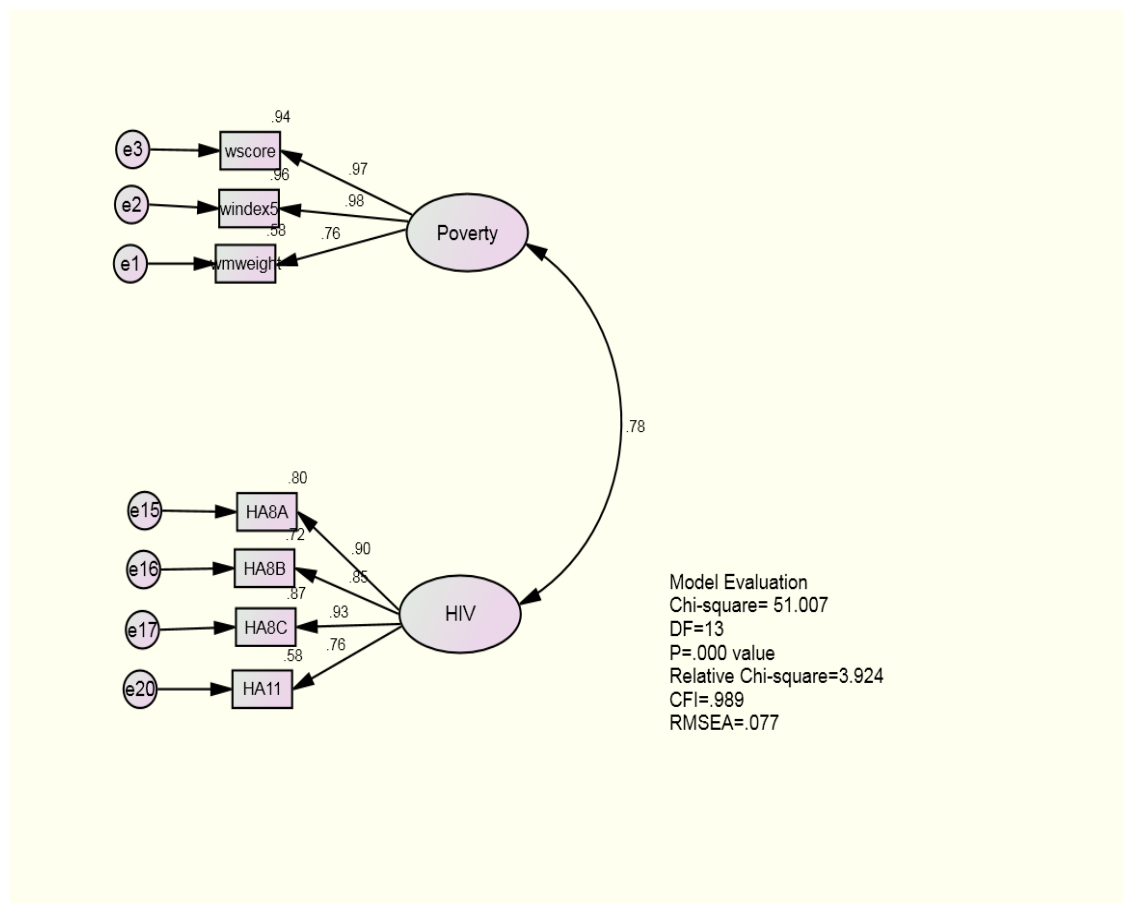
5.2.1.2 Confirmatory Factor Analysis: Assessing pooled Measurement Model:

This section focuses on poverty and HIV measurement model and confirmatory factor analysis for the Mediating Factors as shown in sections 5.3.2.1 and 5.3.2.2

5.2.1.2.1 Poverty and HIV Measurement Model

This method combines the two latent constructs of poverty and HIV in one measurement model and performs the CFA at the same time. Both items deletion and re-specification processes are performed several times until the model reaches satisfactory fit. Five items were deleted from the HIV construct. This method was used because it addresses the issue of model identification and reliability. The final model is shown in Figure 5.1. The factor loading for all the items is above 0.6.

This measurement model required no further deletion. Table 5.2 shows that the comparative fit index (CFI) equals to 0.989, which is > 0.90 , and chi-square/df equals to 3.924 which is less than five (5). The root mean square of error approximation (RMSEA) equals to 0.077, which is less than 0.08, and the chi-square is 0.000, which is less than 0.0001. This indicates that the model employed in the study fits the data and fulfils the requirement for analysis.



Source: SHHS (2010) results using AMOS Graphic analysis

**Figure 5.1: CFA for the Measurement Model Combining Poverty and HIV
Simultaneously**

Table 5.2 Summary of the Model Fit Indices Combining Poverty and HIV

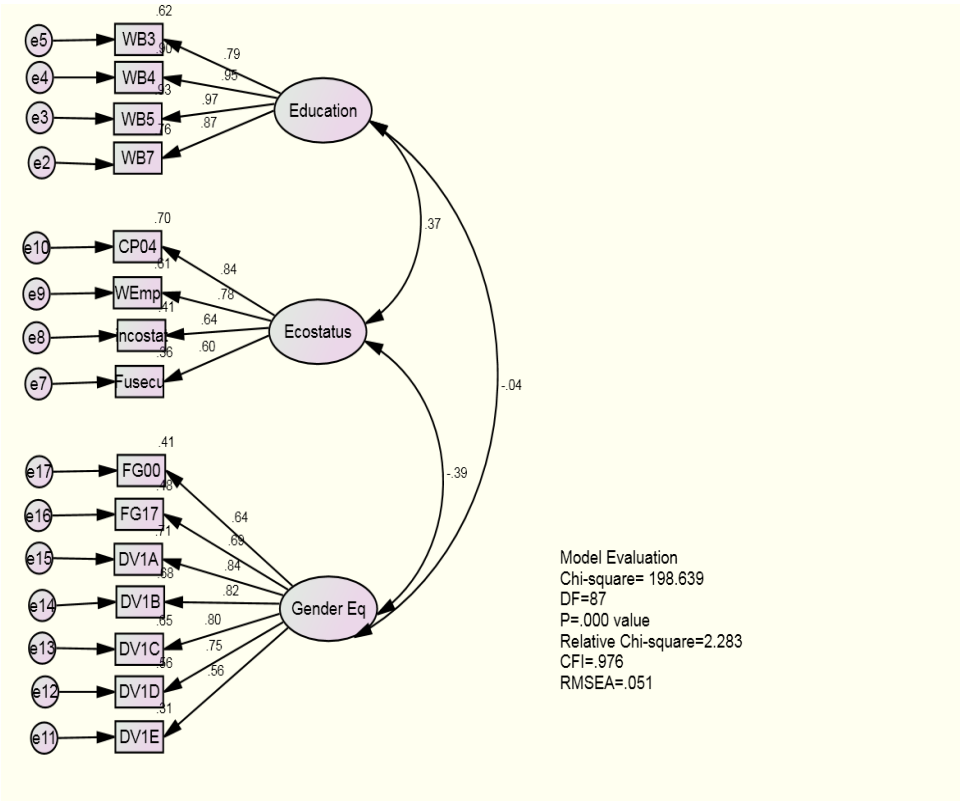
Model	Chi-Square	Df	X ² /df	RMSEA	CFI
CFA	51.007	13	3.924	0.077	0.989

Source: SHHS (2010) Results using AMOS Graphic analysis

5.2.1.2.2 Confirmatory Factor Analysis for the Mediating Factors

In this section, the CFA procedure links the mediating constructs together and examines whether these constructs are highly correlated. In order to achieve the construct validity and the factor loadings, the double-headed arrows in Figure 5.2 links the three mediating constructs of education, gender inequality, and economic status.

Two items were deleted because the factor loading was low (less than 0.5). Table 5.3 shows that the comparative fit index (CFI) equals 0.976, which is > 0.90 , and chi-square/df equals 2.283, which is less than five (5). The root mean square of error approximation (RMSEA) equals 0.051, which is less than 0.08. The chi-square is 0.000, which is less than 0.0001. This indicates that the model employed in the study fits the data and fulfils the requirement for analysis. According to the results from this model, economic status will be measured by the four (4) indicators income status, employment status, food security status, and the monetary power to purchase condoms. Gender equality will be measured by seven (7) indicators and educational status will be measured by four (4) indicators (See Figure 5.2). The details of the items are shown in Table 5.2.



Source: SHHS (2010) results using AMOS Graphic analysis

Figure 5.2: CFA Measurement of the Model between the Mediating Factors

Table 5.3: Summary of the Model Fit Indices Combining the Mediating Factors

Model	Chi-Square	Df	X ² /df	RMSEA	CFI
CFA	198.639	87	2.283	0.051	0.976

Source: SHHS (2010) results using AMOS Graphic Analysis

All the items show highly convergent validity, as the Average Variance Extracted (AVE) was greater than 0.50 (see Table 5.4) and the composite reliability calculated was greater than 0.60. All the values of the individual constructs' reliability were significant, demonstrating that the dataset shows a high level of reliability and validity and was adequately reliable for quantitative analysis. In addition, the correlation between each pair of latent exogenous construct achieved the discriminate validity of less than 0.85 (see Figure 5.2).

Table 5.4

Summary of CFA for all Constructs in Structural Model (Women)

Constructs	Item	Factor Loading	CR (≥ 0.6) $(\sum K)^2 / [(\sum K)^2 + (\sum 1 - K^2)]$	AVE (≥ 0.5) $\sum K^2 / n$
Poverty	W. Score	0.97	0.867	0.767
	W. Index	0.98		
	M. Weight	0.77		
HIV	HA8A	0.90	0.950	0.794
	HA8B	0.84		
	HA8C	0.93		
	HA11	0.76		
Eco. Status	CPO4	0.84	0.810	0.521
	W. Emp.	0.77		
	Income status	0.64		
	Food. Sec	0.60		
Education	WB3	0.79	0.960	0.823
	WB4	0.95		
	WB5	0.97		
	WB7	0.87		
Gender Inequality	FGOO	0.65	0.890	0.540
	FG17	0.70		
	DVIA	0.84		
	DVIB	0.82		
	DVIC	0.80		
	DVID	0.75		
	DVIE	0.56		

Note:

Eco. Status measured by SCP04 (ability to get condoms), W. Emp. (employment status), income status (income status), Food. Sec. (food security and consumption status),

Gender Inequality measured by FGOO and FG17 (accept and encourage continuity of FGM), DVIA, DVIB, DVIC, DVIE (violence and abuse by husbands), DVID (sex negotiation).

HIV measured by HA8A, HA8B and HA8C (knowledge of transmission of HIV from mother to her child), HA11 (Avoid HIV transmission using condoms consistently during sexual intercourse).

Level of Education measured by WB3E (Ever attend school), WB4 (Ability read or write), WB5 (level of education obtained), WB7 (Higher grade obtained at that level of education).

Poverty measured by W. Score (Wealth score), Windex (Wealth index), W. weight (women's wealth weight).

Source: SHHS (2010) results using AMOS Graphic Analysis

5.2.1.3 Assessment of the Normality of the Data

The use of the univariate normality for each variable was tested by examining the skewness and kurtosis value (Hair et al., 2010). The results in Table 5.5 show that the data achieved the satisfied normality assessment, and the value of skewness and

kurtosis was ≤ 2 and ≤ 7 , respectively, indicating that all the variables had high normality assessment.

Table 5.5: Assessment of Normality of the Data

Construct	Variable	Min	Max	Skewness	C.R.	Kurtosis	C.R.
Poverty	W. Score	1.122	3.350	0.196	1.786	-1.578	-7.201
	Windex	1.000	5.000	0.099	0.902	-1.421	-6.486
	W. weight	0.060	0.754	0.258	2.356	-1.505	-6.871
HIV	HA8A	1.000	5.000	-0.223	-2.032	-1.661	-7.583
	HA8B	1.000	5.000	-0.304	-2.777	-1.610	-7.348
	HA8C	1.000	5.000	-0.249	-2.272	-1.647	-7.516
	HA11	1.000	5.000	0.027	0.249	-1.722	-7.858
Eco. Status	CP04	1.000	5.000	-0.115	-1.054	-1.709	-7.802
	W. Emp.	1.000	5.000	0.366	3.337	-1.744	-7.959
	Income status	1.000	5.000	-0.535	-4.885	-1.226	-5.597
	Food. Sec.	1.000	5.000	-0.149	-1.359	-1.358	-6.198
	WB3	1.000	5.000	0.180	-3.262	-1.638	-7.476
Education	WB4	1.000	5.000	-0.171	5.225	-1.246	-5.686
	WB5	1.000	5.000	0.572	1.639	-1.177	-5.375
	WB7	1.000	5.000	0.004	0.032	-1.806	-8.243
Gender Inequality	FG00	1.000	5.000	-0.145	-1.320	-1.320	-6.026
	FG17	1.000	5.000	0.016	-1.562	-1.269	-5.792
	DVIA	1.000	5.000	0.017	0.153	-1.524	-6.955
	DVIB	1.000	5.000	-0.021	-0.194	-1.386	-6.326
	DVIC	1.000	5.000	-0.051	-0.466	-1.347	-6.147
	DVID	1.000	5.000	-0.108	-0.983	-1.385	-6.324
	DVIE	1.000	5.000	0.572	0.150	-1.310	-5.977
	WB3	1.000	5.000	0.180	-3.262	-1.638	-7.476
	Multivariate					74.098	25.493

Source: SHHS (2010) results using AMOS Graphic Analysis

5.3 Analysis and the Findings:

This section shows the results of the analysis based on the relationships between poverty and HIV among women. The findings emerged from the analysis of the model and hypotheses testing. This section begins by describing the demographic characteristics of the respondents.

5.3 .1 Demographic/ Socio-economic Data of the Informants

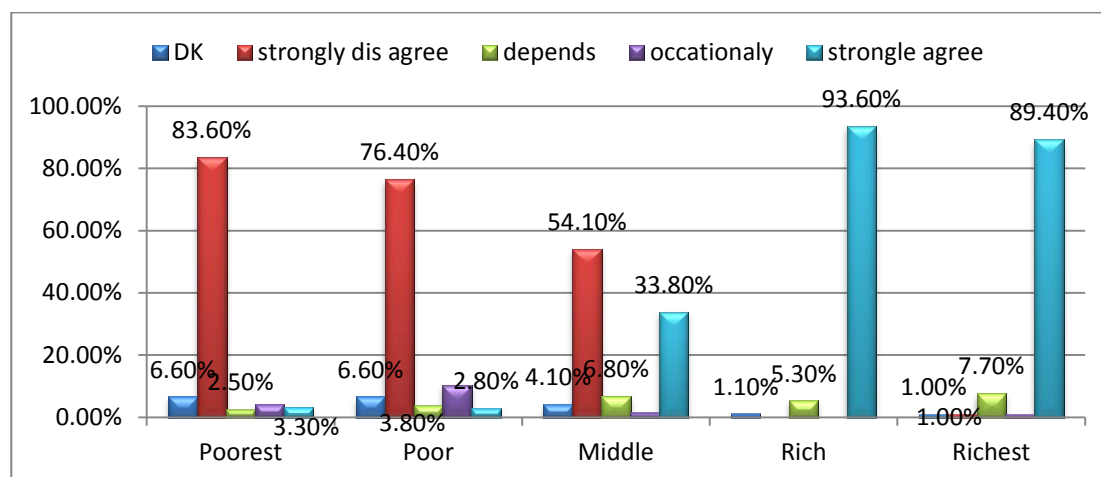
SPSS software was used to generate descriptive analysis of the respondents from the SHHS survey. The results show that 45.6 percent of the participants were poor and 50.2 percent were urban residents, while 49.8 percent were rural inhabitants. The respondents were between the ages of 15 to 49 years old; the median age was 32 years old and represented all the fifteen (15) States in Sudan. Slightly more than half of the participants (52.6%) were currently married. About 55.6 percent of the respondents were uneducated and 54.2 percent were unemployed (see Table 5.6). These results indicate that women were less educated and employed compared to men (see table 4.4 chapter 4). Figures 5.3, 5.4 and 5.5 show the descriptive findings on the relationship between poverty and HIV among women using Chi-square analysis. Detailed results can be found in appendix (D).

**Table 5.6 Summary of the Characteristics of the Respondents (Women)
(Sample size 500)**

Variables	Description	Frequencies	Percentage
Area	Urban	251	50.2%
	Rural	249	49.8%
Age	15 – 19	101	20.2%
	20 – 24	79	15.8%
	25 –29	83	16.6%
	30 – 34	70	14.0%
	35 – 39	74	14.8%
	40 – 44	56	11.2%
	45 – 49	36	7.2%
Education	None	278	55.6%
	Primary	96	19.2%
	Secondary	103	20.6%
	University	23	4.6%
Marital status	Formerly married	263	52.6%
	Divorced	28	4.6%
	Widowed	13	2.6%
	Never married	196	39.1%
Employment status	Currently not employed	271	54.2%
	Inconsistent job	8	1.6%
	Temporarily employed	23	4.6%
	Currently employed	44	8.8%
	Employed	154	30.8%
Wealth Index	Poorer	229	45.6%
	Middle	74	14.8%
	Fourth	94	18.8%
	Rich	104	20.8%

Source: SHHS (2010) results using AMOS Graphic Analysis

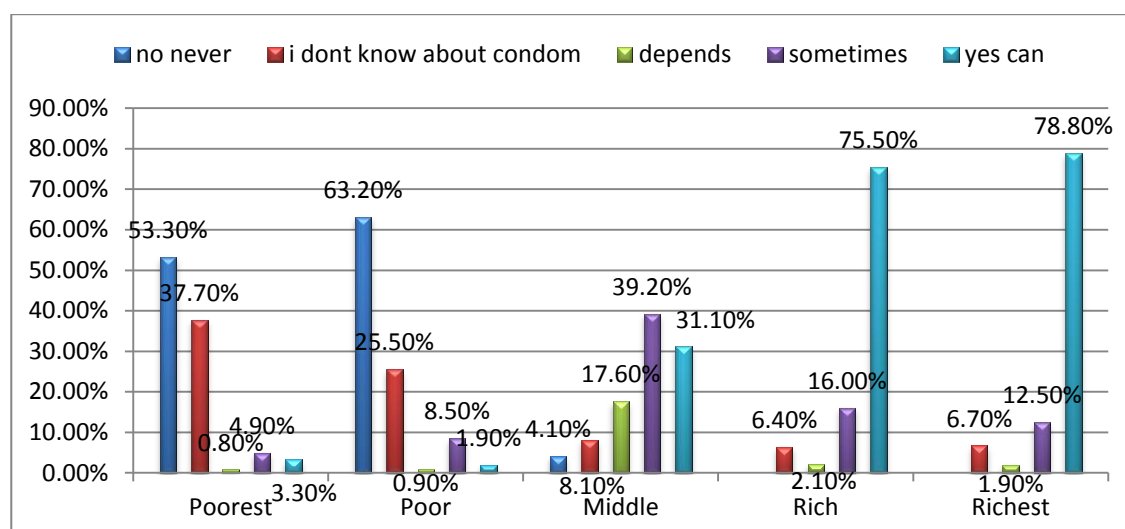
Figure 5.3 shows a strong correlation between poverty and lack of awareness about condom use as a protective method against HIV among women. The results show that women from rich segments of the society are more knowledgeable about condom use than those from poor resource settings. Moreover, Figure 5.4 shows that rich women are better able and have more opportunities to procure condoms than poor women.



Source: SHHS (2010) results using AMOS Graphic Analysis

Note: See the details of the Chi-Square analysis and the p-value results in appendix (C)

Figure 5.3 Relationship between Wealth index and Condom use

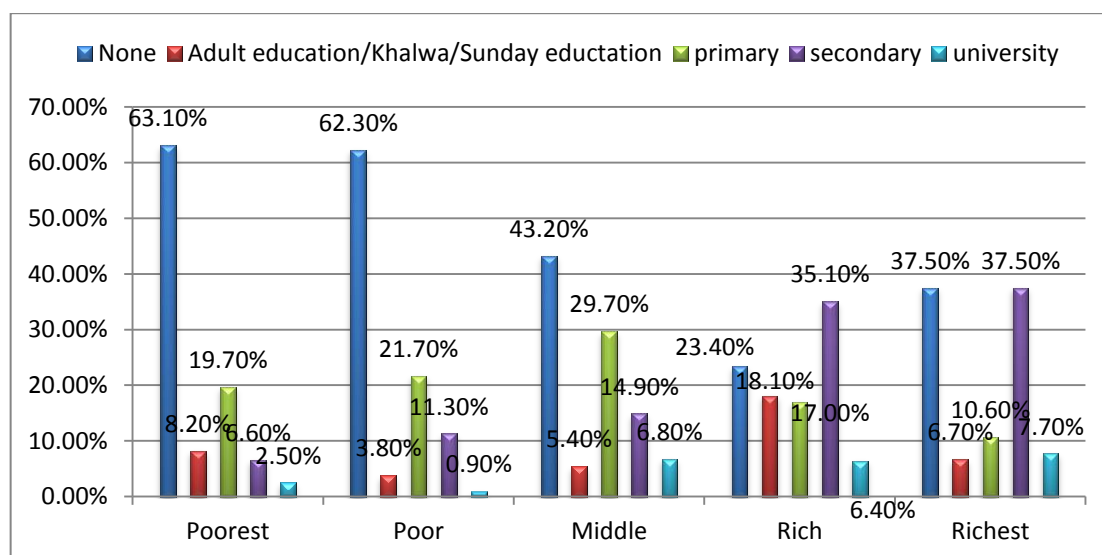


Source: SHHS (2010) results using AMOS Graphic Analysis

Note: See the details of the Chi-Square analysis and the p-value results in appendix (C)

Figure 5.4 Relationship between Wealth index and ability to procure Condoms

Figure 5.5 shows that there is strong correlation between poverty and low education. Women from rich segments of the society are more educated compared to the poor, and are thus better informed about HIV prevention.



Source: SHHS (2010) results using AMOS Graphic Analysis

Note: See the details of the Chi-Square analysis and the p-value results in appendix (C)

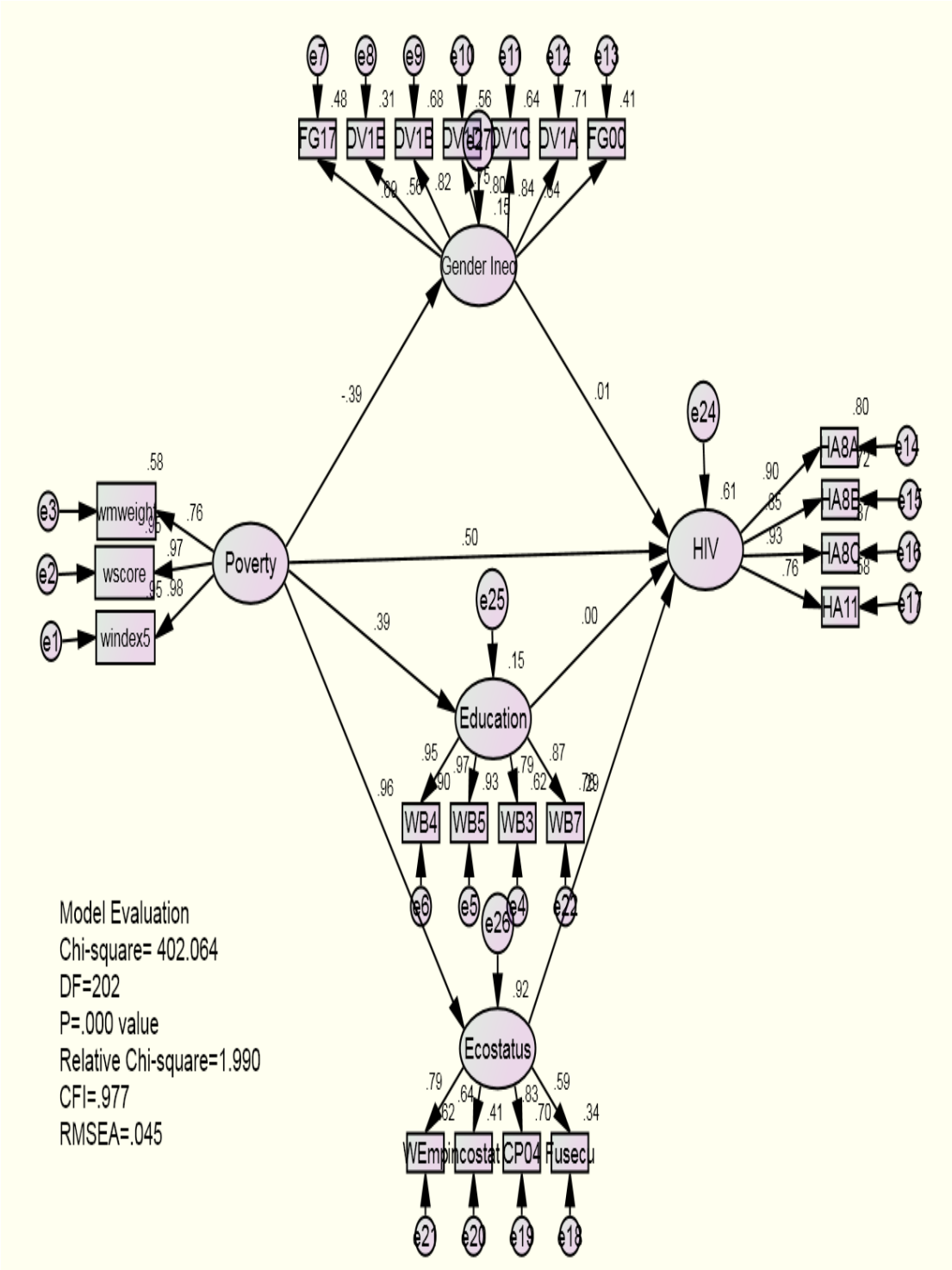
Figure 5.5 Relationship between Wealth index and level of Education

According to the wealth index quintiles, the distribution of the respondents show that women in the survey were poorer compared to their male counterparts. Approximately 45.6 percent of women were from poor resource settings compared to 29.6 percent of the men. This indicates that men in Sudan have a favoured socio-economic status compared to women.

5.3.2 The Full Structural Model

Figure 5.6 shows that the Comparative Fit Index (CFI) equals 0.977, which is > 0.90, and chi-square/df equals 1.990, which is less than 5.0. The Root Mean Square of Error Approximation (RMSEA) equals 0.045, which is less than 0.08. The chi-square is 0.000, which is less than 0.001 indicating that the model employed in the study is

suitable for the analysis. The findings from the full model indicate that poverty is a significant predictor of the three mediating factors of education, economic status, and gender inequality (see Table 5.7).



Source: SHHS (2010) results using AMOS Graphic Analysis

Figure 5.6: The Full Structural Model of the Inter-relationships between Constructs

Table 5.7: The Full Structural Model Regression Weights for Women

Relationship	Estimate	S.E.	C.R.	P-value	Result
Education ← Poverty	0.366	0.043	8.589	***	Significant
Ecostatus ← Poverty	0.563	0.037	15.105	***	Significant
Gender Eq ← Poverty	0.268	0.033	-8.164	***	Significant
HIV ← Poverty	0.505	0.224	2.248	***	Significant
HIV ← Education	0.205	0.037	0.005	0.996	Not significant
HIV ← Ecostatus	0.499	0.391	1.275	0.202	Not significant
HIV ← Gender Eq	0.010	0.053	0.187	0.851	Not significant
Windex ← Poverty	1.000				Significant
Wscore ← Poverty	1.070	0.017	63.607	***	Significant
Mweight ← Poverty	0.126	0.005	24.963	***	Significant
WB3 ← Education	1.000				Significant
WB5 ← Education	0.968	0.037	26.168	***	Significant
MB4 ← Education	1.047	0.041	25.563	***	Significant
WB7 ← Education	1.135	0.050	22.866	***	Significant
Fusec ← Ecostatus	1.000				Significant
WEmp ← Ecostatus	1.707	0.126	13.586	***	Significant
incsta ← Ecostatus	1.147	0.097	11.842	***	Significant
CPO4 ← Ecostatus	1.660	0.118	14.073	***	Significant
HA8A ← HFV	1.000				Significant
HA8B ← HFV	0.942	0.036	26.268	***	Significant
HA8C ← HFV	1.039	0.032	32.437	***	Significant
HA11 ← HFV	0.865	0.039	21.998	***	Significant
FG00 ← Gender Eq	0.929	0.069	13.502		Significant
DVIB ← Gender Eq	1.206	0.072	16.699	***	Significant
DVID ← Gender Eq	1.098	0.072	15.340	***	Significant
FG17 ← Gender Eq	1.000			***	Significant
DVIE ← Gender Eq	0.796	0.068	11.697	***	Significant
DVIC ← Gender Eq	1.263	0.071	16.387	***	Significant
DVIA ← Gender Eq	1.352	0.074	16.962	***	Significant

Note: *** indicate a highly significant at < 0.001

The Arrows indicated the path relationships between the all constructs and variables.

Estimate = 1.000 means that the regression weight is fixed, indicates that the relationship between each two variables has the same effect.

Source: SHHS (2010) results using AMOS Graphic Analysis

The model shows a strong relationship between poverty and HIV among women in Sudan. Poverty was predictor of its associated factors low economic status, low level of education, and gender inequality. Poverty renders women less able to attain sufficient education and food and have less access to formal employment. It also means less empowerment. This result supports objective three of this study, that poor women were more vulnerable to HIV-high risk behaviour.

The path coefficients for these factors indicate that they are positively linked to HIV. The statistical results of the full structural model specified that there is positive but insignificant relationship between the three mediated factors, low economic status, low level of education, and gender inequality in regards to HIV. This occurs as the result of the strong and direct relationship between poverty and HIV reduced the effect of these mediating factors.

The statistical results of this study show that low level of education, gender inequality, and low economic status do not contribute more to the spread of HIV among women when compared to men (see Table 4.8s and 5.7). However, all the variables used in this study in terms of education level, employment and even economic status indicate that Sudanese women were less educated, employed, and more poor than men. This is due to cultural factors that do not empower Sudanese women, particularly among the tribes where woman tend to internalise their fears of losing their marital status to the extent that simply thinking illicit thoughts could be construed as being unfaithful to their husbands.

Apart from cultural dogmas, socio-economic support is a major factor explaining why such women still stick to their husbands. Similarly, the intersection of masculinity and quest to display socioeconomic success is a factor that encourages infidelity amongst men. Most men view extramarital relationships as ways of expressing economic status and masculine prowess. To some, it is an opportunity for sexual gratification. An understanding of the links between wealth and masculinity will aid the understanding of issue of extramarital sex in HIV issues.

The results show that women in Sudan are poorer, less educated, and unemployed than men (55.6 % and 54.2% compared to 34.2% and 32.2% respectively). This indicates how women socially and economically depend on men. The study suggests that women in Sudan tend to withhold the actual pains they face in their

marital life because they are afraid to lose their marital status. The fear of losing their marital status and the stigma attached to divorce can be generalised to the majority of Sudanese women, where the levels of social and economic dependence on spouses is extremely high and women lack the courage to reveal that their male counterparts are engaging in harmful practices. However, this is not the case for men who do not hesitate to reveal their inappropriate practices and harmful acts against women.

In Sudan, as in many African nations, the real status of women is sufficiently tied to marriage regardless of economic, educational, political, or religious accomplishments. In the event of such confrontations, women may openly lose the support of their men. This can come in form of abandonment, divorce, or marrying another wife or wives. It can also come in the form of suspending the pretence and diplomacy of being a good husband. The reality of this view is seen in the fact that an unmarried woman is relatively free to choose whom to marry. This freedom ends there. Once married, the woman is no longer equally free to choose to divorce. Gender inequality in Sudan is such that makes opting out an unthinkable and unlikely option for women.

5.4 Hypotheses Testing

This study addressed questions in chapter 1 and deals with the effects of the three mediating variables in the relationship between poverty (independent variable) and HIV (dependent variable) among women. This chapter aims at answering research questions 1, 2, 3 and 5 as outlined in chapter 1.

5.4.1 The Direct Relationship between Poverty and HIV

The measured model has a satisfactory fit and explains the relationship between poverty and HIV (See Appendix D). Table 5.8 shows that poverty directly influences

HIV. The standardised parameter estimate was 0.777 with a CR of 21.729 (P- value less than 001). The probability of arriving at a critical ratio as large as 21.729 in absolute value is 0.000 (less than 0.001). On the other hand, the regression weights for poverty in predicting HIV is significantly varied from zero at less than 0.05 level (two-tailed). The regression weights result show that if poverty increases by one (1), HIV will increase by 0.777. This implies that any increase in poverty will lead to increasing women's vulnerability to HIV. The analysis confirms that the different temporal nature of the variables between wealth quintiles and HIV is not likely to have a significant effect on the results. This implies that poor women are more vulnerable to HIV than those who come from rich segments of the society.

This study provides empirical evidence that there is significant positive direct connection between poverty and HIV. This result is consistent with several studies on poverty associated with socio-economic and socio-cultural parameters that influenced women's sexual behaviour and vulnerability to HIV (Masangala, 2007; Doyal & Anderson, 2005, Dowsett, 2003; Gillespie & Kadiyal, 2005). The results from this study suggest that due to poverty, some women may be forced to engage in marginal activities to fulfil their financial needs such as engaging in commercial sex or taking multiple sex partners. Moreover, the non-use of condoms causes them to be more vulnerable to HIV (Abdelrahim, 2010).

Table 5.8: The Direct Effect of Poverty on HIV

Relationship	Estimate	S.E.	C.R.	P-value	Result
HIV ← Poverty	0.777	0.036	21.729	***	Significant
Windex5 ← Poverty	1.000			***	Significant
Wscore ← Poverty	1.056	0.018	58.636	***	Significant
Wmweight ← Poverty	0.126	0.005	25.324	***	Significant
HA8A ← HIV	1.000			***	Significant
HA8B ← HIV	0.942	0.036	26.317	***	Significant
HA8C ← HIV	1.038	0.032	32.413	***	Significant
HA11 ← HIV	0.866	0.039	22.025	***	Significant

Note: *** indicate a highly significant at < 0.001

The Arrows ← indicated the path relationships between the all constructs and variables.
Estimate = 1.000 means that the regression weight is fixed, indicated that the relationship between the each two variables has the same effect.

Source: SHHS (2010) results using AMOS Graphic Analysis

5.4.2 Relationship between Low Economic Status and HIV

The measured model has a satisfactory fit (see appendix D). Hypothesis (1) outlined in chapter 3 suggests that low economic status directly influences HIV. Table 5.9 shows a positive but insignificant relationship between low economic status and HIV. This indicates the partial effect of the mediating factor due to the strong direct relationship between poverty and HIV. The standardised parameter estimate was 0.299 with a CR of 1.267. The probability of getting a critical ratio as large as 1.267 in absolute value is 0.205. In other words, the regression weights for economic status in predicting HIV is positive but insignificant.

However, the findings in section 5.5.1 show a direct positive and significant relationship between poverty and HIV. This indicates that Sudanese women are highly vulnerable to HIV and has proved that this is not only limited to women from low socio-economic backgrounds, but is generalised to those from different levels of society. As mentioned earlier, poverty was found to have a positive and significant relationship with HIV. This reduces the effect of other mediating factors such as low economic status which showed a positive but insignificant relationship with HIV-risk.

However, the Chi square results indicate that low economic status measured by the variables mentioned above, was a significant contributor in increasing the inability of men and women to have good knowledge and procure condoms.

This study suggests that poverty deprives women and aggravates their livelihood by disempowering them, and creating a form of economic dependency on men, hence exposing them to HIV (Masangalah, 2007; Allin et al., 2009). This is further aggravated in cases of divorce or when women become widows as they lose the support from their husbands; a reality that places much pressure to live on their own with many challenges.

Table 5.9: The Hypothesis Testing of the Casual Relationship between Low Economic Status and HIV

Relationship	Estimate	S.E.	C.R.	P-value	Result
Low economic Status ← Poverty	0.936	0.0033	28.161	***	Significant
HIV ← Poverty	0.504	0.225	2.237	***	Significant
HIV ← Low economic status	0.299	0.236	1.267	0.205	Not Significant

Source: SHHS (2010) results using AMOS Graphic Analysis

According to the reviewed literature (Valk & Koopman, 2001; Oni, 2005; Khamis, 2013), the knowledge of condom use and its availability is an important indicator in reducing exposure to HIV risk. Approximately 45.4 percent of the women in this study were either not aware of the use of condoms or were unable to obtain them, compared to 38.8 percent of the men.

The gender gap in terms of employment and income is widespread in Sudan. A 2012 UNDP report noted that the gender gap indicators were higher for Sudan compared to other countries in the region. Consistent with data from UNDP (2012), this study has been able to show that 54.2 percent of Sudanese women are unemployed

compared to 32.2 percent of the men. As such, women and girls in Sudan are dependent on men for their economic security. This contributes significantly to increased female vulnerability to HIV, because they fear abandonment, violence, and lack sex negotiation.

The majority of women in the study from poor resource settings are unemployed with low income. This suggests that many factors such as the lack of transparency in discussions, sex negotiation with partners, lack of income, and inaccessibility to jobs are important issues that expose women to HIV risks. In addition, lack of finance and having lost husbands who are their major source of livelihood may force divorced and widowed women to engage in sex work in order to raise income to feed their children and other dependents (Abdelrahim, 2010). They also engage in marginalised work such as selling tea on the streets - a public phenomenon in Sudan. Tea sellers are considered a vulnerable group to HIV especially from migrating workers such as truck drivers (SNAP, 2010). In this instance, most of their clients are opportunistic men many of whom are prepared to spend their monies on them. This may expose them to sexual behaviour that increases their vulnerability to HIV.

Some women may also indulge in extra marital affairs during the long absence of their husbands, which make them vulnerable to HIV. These behaviours are probably symptoms of the socioeconomic conditions in these areas rather than independent risk factors. In addition, the findings show that men from the poorest resource settings have several sexual contacts (52.1%), compared with only 10.8 percent from richest which increased exposure to HIV which may increase their exposure to HIV (Hankins et al., 2002). The results in section 5.5.2 show that low economic status in terms of food insufficiency gives rise to adoption of risky behaviours, mainly among women who may be forced to engage in sex work to meet their needs.

5.4.3 Relationship between Education and HIV

The model employed in the study to model the effect of education is suitable for analysis (see appendix D). Hypothesis (2) suggests that low level of education is positively related to HIV- risk. Table 5.10 shows that poverty was significantly predictable of low level of education and a positive but insignificant relationship between low level of education and HIV. This is due to the strong significant relationship between poverty and HIV, which reduced the effect of the mediating factors such as low level of education. The standardised parameter estimate was 0.004 with a CR of 0.098 (P value 0.922). The possibility of obtaining a critical ratio of 0.098 in absolute value is 0.922. In other words, the regression weights for low level of education in predicting HIV is insignificantly different from zero.

However, the statistical results indicated partial support for women's vulnerability in terms of low level of education with a positive but not significant relationship for women. This is due to the partial effect of low level of education as a mediating factor for women and the strong direct relationship between poverty and HIV. However, the chi-square results (See appendix C) show that the proportion of both men and women who attained the lowest level of education were more exposed to HIV than educated people.

Thus, education is more protective against HIV for men than women. This is strong indication that the support of education systems targeted at girls in rural areas is almost certainly a vital aiding factor for HIV prevention in Sudan

The findings provide vigorous support for the argument that lack of education is a significant risk factor for HIV, and that reckless lifestyles such as unprotected sex adds to the HIV risk factors. This finding supports objective two. It also confirms the findings from previous studies that show negative relationships between education and HIV (Jere, 2012; Hargreaves et al., 2007; Tladi, 2006).

In addition, the results analysed from the Sudan Household Health Survey showed that men were more educated and potentially less vulnerable to HIV compared to women. It presented approximately 60 percent of women as uneducated as against 34.2 percent of men (see Tables 4.1 and 5.1). These findings were consistent with the data from the UNDP report (2012). The literature indicates that HIV/AIDS knowledge has been widely linked to other HIV/AIDS protected related behaviours such as condom use and safe sexual behaviours (Valk & Koopman, 2001; Oni, 2005).

Moreover, the PLHIV survey showed that infected men were more educated than women thereby highlighting the importance of enhancing educational attainment for women to reduce their vulnerabilities and improve their welfare. The study suggested that women lacked knowledge and skills in adopting safe behaviours, in addition to the unlikely use of condoms.

Condom use as a preventative method is not under the female's control. It is somewhat of a taboo for a married woman to suggest the use of condom in marital sex. This is largely seen as violating the prenatal mentality and contradicts the concept of trust supposedly associated with marriage. Again, most women in Sudan believe that the risk of protecting their marriage is worth it and outweighs the prospect of HIV, whilst the dominant norms in many societies relating to reproductive and sexual health should be their main concerns

Physical violence and the fear of abandonment due to illiteracy, acts as impediment for Sudanese women who tend to discuss safe sex through condom use, and faithfulness with their partners, or avoid relationships that they view to be risky. The paradox is that such women are aware of the problem and are able to talk about it. Yet, they are unable to address and tackle it because of certain stakes posed by society and culture. In addition, some faiths preach against condom use and support total abstinence.

Table 5.10: The Hypothesis Testing of the Casual Relationship between Low Level of Education and HIV

Relationship		S.E.	C.R.	P-value	Result
Estimate					
Low level of Education	Poverty	0.356	0.039	9.175	*** Significant
HIV	Poverty	0.776	0.038	20.325	*** Significant
HIV	Education	0.004	0.038	0.098	0.922 Not Significant

Source: SHHS (2010) results using AMOS Graphic Analysis

As earlier mentioned, evidence from the literature stated that low levels of education was a strong contributor to increased HIV prevalence (Tladi, 2006; Fako, 2010; Hargreaves et al., 2007; Glynn et al., 2004). Poverty coupled with the weak social position of women in the society contributes to unsafe sexual practices because of inadequate knowledge and inaccessibility to means of protection due to low level of education. The results show that more than half of women and 63.3 percent of poor women were not educated and a large proportion of women (83.6%) are not aware of condom use as protective method against HIV and 63.6 percent do not know where to get condoms, indicating low knowledge of HIV prevention and protection methods.

The findings supported by the results from the FGDs, showed that 22.9 percent of the patients never attended school and 28.3 percent were educated at primary level (see the quote below). A 31 years old woman patient said,




“I went to school up to primary 4, but had to leave because my father claimed that he had no money to pay my school fees.”

5.4.4 Relationship between Gender Inequality and HIV

The model employed in the study is suitable and has a satisfactory fit (See appendix D). Hypothesis (3) suggests that gender inequality significantly influences HIV. Table 5.11 shows positive but insignificant relationship between gender

inequality and HIV. The standardised parameter estimate was 0.007 with a CR of 0.156 (P value 0.876). The probability of getting a critical ratio of 0.156 in absolute value is 0.876. In other words, the regression weight for gender inequality in predicting HIV is not significantly different from zero. The effect of the gender inequality mediating factor is not significant, this is due to the strong direct relationship between poverty and HIV (Beta 0.78) This indicates that Sudanese women in general are vulnerable to HIV. However, poverty leads to deprivation and reduces the empowerment of women. The results propose that HIV and poverty underpin each other in a vicious cycle, with poor women being more exposed to the disease due to various harmful acts from some men in Sudan, that make them more socially dependent. This supports the achievement of objective three, that poor women were more vulnerable to HIV.

Table 5.11: The Hypothesis Testing of the Casual Relationship between Gender Inequality and HIV

Relationship	Estimate	S.E.	C.R.	P-value	Result
Gender Inequality  Poverty	0.311	0.036	8.554	***	Significant
HIV  Poverty	0.779	0.039	20.125	***	Significant
HIV  Gender Equity	0.007	0.045	0.156	0.876	Not Significant

Source: SHHS (2010) results using AMOS Graphic Analysis

Social and traditional customs in Sudan coupled with poverty creates suffering from stigma of sexual violence, violates human rights, and increases vulnerability to HIV, especially for women. This situation is severe and highly common in many communities in Sudan. Another issue is that some young girls in Sudan are forced into marriages at a very tender age which places them at higher risk. Clark (2004) asserts that some women are simply too young to make informed decisions about their marriage partners or about the implications of the marriage itself. This argument is

supported by the findings from the FGDs among PLHIV. An instance of this is this quote by a 25-year-old divorced woman:

“I was forced to marry a daily worker at the age of 16. My husband used to dislike me for not being good looking. He used to tell me of his ‘sexual relationships’ whenever he visited Khartoum, the capital of Sudan. After few months of marriage, I started keeping unwell. Both my husband and I were tested and found to be HIV-positive. After less than a year, my husband left me and went to the city. I was forced to work in the fields despite my sickness to feed my children, mother and grandmother.”

Approximately 36.7 percent of the women who participated in the FGDs mentioned that the main factors that led them to engage in high-risk behaviours and exposed them to HIV was gender inequality which aggravated their poor standards of living. Gender inequalities in individual relationships within the community, labour force, and political circles affect women all over the world, with double emphasis in Sudan. One of the respondents in the FGDs, a 37-year-old woman spoke out saying:

“Gender inequality and poverty not only intensify the risk of HIV but also expose women to a more vulnerable situation than men to its impact.”

The powerlessness of women in sex negotiation and use of condoms with sexual partners and their lack of a right to decide their marriage life are a result of gender inequality, which contributes to unsafe sexual practices (Matthews, M. & Little, F. 2002). Some women in Sudan forced some women to marry the brother of the deceased husband to take care of children. This argument is supported by the findings from the FGDs among PLHIV. The experience of a 39-year-old widow lays credence to this view:

“I was forced into marriage with my late husband’s brother, who had different sexual relationships, otherwise I would be forced to return to my parental home and take care of my children, with limited external support. I got the virus from my late husband and almost all the cash income from my husband’s domestic daily work was used to settle our treatment bills for HIV/AIDS.”

The findings show that women in Sudan are vulnerable to HIV/AIDS because they are socially dependent on men. The following quote provides evidence that women tend to be poor, marginalised, and powerless making them vulnerable to HIV.

The following is the view of a 43-year-old woman participant in the FGDs:

“My husband does not regret that he was infected by the virus. He keeps telling our friends and his family that I am the one who transferred the virus and whilst he failed to inform them that he was HIV positive as well”

An instance is this quote by 39-year-old divorced woman:

“Selling tea on the street... it so difficult, where you are surrounded by people who point out at you as a prostitute doing wrong things and engaging in illegal behaviours, I experienced it. I was forced to do this job to feed my family and children after my husband divorced me, He thinks I am the one who gave him the virus.

The powerlessness of women and young girls, combined with established cultural practices like FGM, polygamy, levirate marriage and widow inheritance, make them more vulnerable to HIV risk in Sudan (SNAP, 2010). Despite the extended efforts to eradicate FGM, approximately 90 percent of Sudanese women in Northern Sudan still practice it and another 45 percent of women supported the practice (Dibua, 2010, UNICEF, 2010).

The results of this study show that men and women widely accepted circumcision practices against women. These results are consistent with several studies that showed evidence of HIV prevalence among females due to different forms and practices of FGM (Kun, 1997; Brady, 1999; Mitike & Deressa, 2009; Atomsa & Raju, 2014). In addition, the participants in the FGDs mentioned various traditional practices such as circumcisions, cupping, and using old and contaminated needles to make tribal marks on the body which may expose them to HIV risk.

Cultural and religious beliefs that strictly enable women to remain faithful to their husbands in all conditions are not as strong in the case of men. In particular, the

practice of polygamy among some men who have irregular sexual contacts outside marriage exposes and increases the risk of their female partners becoming infected. About 52.5 percent of the women in the household survey reported that their husbands had another wife/wives or partner(s). The findings from the FGDs support this finding with the majority of the women in the FGDs claiming that they were infected by their husbands and were stigmatised in the community. The findings of section 4.4.4 are consistent with several studies, which indicate that gender inequality had a significant influence on HIV transmission (Kemboi et al., 2011; Kamal et al., 2009. However, as Dowsett (2003) observed, a recent discussion on complex theory of gender has wide effects on HIV/AIDS in terms of vulnerability and impacts.

In some cases, some men can prevent their wives from travelling abroad, even employed women, who may benefit from such trips. However, this prohibition is not strictly imposed. Furthermore, women in Sudan cannot work between 10 pm to 6 am, with the exception of women who work in professional jobs and health services (ILO, 2010). The constraints they face prevent disadvantaged women from expressing their deep felt sufferings and force them to inhibit their overwhelming feelings. For instance, women in Sudan have the right to divorce according to different types of laws, while men can divorce without referring to the court. Hence, divorce has social and economic consequences for women and the entire family, thus preventing women from seeking divorce. Although this discrimination is largely faced by women and girls, the consequences affect the entire society.

In the Western States and Blue Nile State, particularly in rural areas, some women may be forced to work in very difficult conditions, and some types of works do not physically suit them (SHHS, 2006), while men remain at home without doing the home chores. This indicates how women are socially dependent on men. Another issue is inheritance practices against women, such as restrictions on access to the

ownership of land (FAO, 2012), and the use and modes of land transfers, with the derived rights being weaker than male rights.

Women in Sudan have little choice in dealing with and negotiating their own sex lives. Where heterosexual transmission is the main mode, the gender issues are quite clear (Go et al., 2003). Sex negotiation among young people in Sudan prior to marriage remains stigmatised and is considered taboo. Males are considered superior members of the society and are easily exonerated in issues like sexually transmitted infections. In addition, they view extramarital sex as a vital part of gendered social organisation and encounters with women other than their wives such as sex workers, place their wives at greater risk of the virus.

On the other hand, femininity is attributed to purity and tilts towards weakness. In this context, we can say that simply being married is a key risk factor for women who do not have control over abstinence and condom use at home or over the sexual activities of their husbands outside. Resulting from these factors, married women are regarded as more at risk of contracting the virus through their partners than those female sex workers who constantly engage in sex as their main source of income. It is a known fact that condom use can be tasking to introduce into marital sexual relationships. Facts and evidence would show that it is likely for people to use condom, as their relationships grow more intimate (Smith, 2007). Moreover, traditional beliefs in communities, mainly in rural areas keep women from disclosing their status, and seeking counselling and/or treatment for those infected.

Wars and conflicts in Sudan cause greater exposure to sexual abuse and rape, especially in Darfur. Moreover, there is a culture of exemption for perpetrators, particularly when they are state actors (Refugees International, 2007). Given the picture explored above, and in the light of the literature review and results of the study, it is possible to conclude that women in Sudan are at increased risk of HIV due

to poverty and socio-economic powerlessness compared to men. This result indicate the achievement of objective three of this study, that poor women were more vulnerable to HIV-high risk behaviour. The study aptly calls for positive changes in men's norms and behaviour towards women.

5.5 Summary of the Findings

The full structural model in Figure 5.3 shows high reliability and fulfils the standard requirement for analysis. The results show strong evidence that poverty is a predictor of low level of education, low economic status, and gender inequality. Table 5.8 supports the direct significant relationship between poverty and HIV among women. The findings conclude that poverty is considered a key factor of vulnerability to HIV risk. Poor women and households are likely to be stricken by socio-economic constraints with increasing chances of being exposed to HIV than affluent women and households.

The results in section 5.4.2 reveals that poverty is a predictor of low economic status for women. Thus, poor women need access to meaningful jobs to reduce their independence on their husbands. The findings in Table 5.8 show a positive but insignificant relationship between low economic status and HIV. This may cause some Sudanese women to engage in marginal jobs to meet their needs such as selling tea or food on the street, which makes them vulnerable to HIV. Many studies conducted among female sex workers in Sudan revealed that the majority (80 to 90 percent) engaged in sex work for financial reasons (Abdelrahim, 2010: IBBS, 2103).

The findings in section 5.4.3 show a positive relationship between low level of education and HIV infection. This is supported by the finding that more than half of

women in the household survey and FGDs are not educated. The majority of women lack knowledge of condom use as protective methods against HIV.

The finding in section 5.4.4 shows a positive estimate between gender inequality and HIV. The study suggests that the majority of Sudanese women are vulnerable to HIV due to poverty and marginalisation in the society due to socio-economic and cultural reasons. The study suggests that poverty is a key factor in increasing women's vulnerability to HIV but social, cultural and structural factors are other important factors that exposes women to HIV risk. WHO (2013) reported that women are much more likely than men to tolerate violence, sexual abuse and lack of power in sex negotiation, particularly young women.

Arguments on risk and vulnerability are often concentrated on resource allocation and financial regulations (Greener & Sarkar, 2010). Thus, at the national level, any serious policy interventions aiming at controlling the prevalence of HIV/AIDS must incorporate strategies of empowering women. This can be achieved through improvements in income generation, capacity building, and offering equal opportunities for employment.

CHAPTER 6

Coping Strategies among People Living with HIV/AIDS

6.1. Introduction

Coping is defined as handling risk that is not equally distributed and where people are not equally able to access resources. It is generated by individuals from different socio-economic segments of the society through complex processes of economic, social, and cultural conditions. Livelihood coping strategies are said to be the sum of all the various activities carried out by people in generating income for their livelihood (Chambers & Conway, 1992). These activities depend on people's socio-economic status. HIV/AIDS aggravates poverty through morbidity and mortality of productive adults. In South Africa, as in some other African states, HIV/AIDS is reaching a stage in which AIDS morbidity and death rate is increasing speedily.

This results in various coping strategies to cushion the impact of the epidemic (Dorrington et al., 2001). A situation whereby adults are sick and some are more likely to stay in bed for a long time due to sickness, forces the youth and elderly to care for them. This situation can create uncontrollable pressure and extra burden on households in their struggle for living. Deprived households are often the worst struck and more exposed to the long drawn out effects and invisible burden of HIV/AIDS (Barnett & Whiteside, 2000).

Young girls are often forced to engage in commercial sex. This, to them, is the last resort and the only way they can alleviate their sufferings and/or meet their needs. Such girls sometimes throw caution to the winds, even though they know that they may be at risk of becoming infected with HIV (Nyambedha, 2004).

An important aspect of the impact of this disease is that it may aggravate poverty and increase the suffering of HIV infected households. The life expectancy of HIV-infected persons in Africa , after the initial infection, is shorter than in the developed countries. This has been rightfully attributed to limited access to resources for effective care, support and management. HIV-infected persons in Africa survived approximately five to seven years. This is about half the time compared to the richer countries (Cohen, 2006).

The qualitative data sets taken from the FGDs among PLHIV assisted in investigating the associations between constraints, coping strategies, and the transmission of poverty for families affected by HIV and AIDS from one generation to another. These strategies include access to assets and resources, dealing with shocks and uncertainties, social networks and experiences of stigma and discrimination. Martin (2004) conducted studies in Thailand, Vietnam, Cambodia and India and asserted that coping strategies include reduction in savings, selling of assets, borrowings and changes in the households' living standards and structures.

This chapter discusses the socio-economic problems and coping strategies associated with PLHIV in Sudan. The findings of the PLHIV survey are presented using the socio-economic variables that explained the impacts of HIV. Further, it is supplemented by the qualitative data arising from the FGDs.

This chapter is divided into seven major sections. Section 6.1 provides a brief introduction. Section 6.2 reviews the statistical techniques used in the analysis of the survey data. Section 6.3 shows the result and describes the demographic and socio-economic features of the respondents in the survey. Section 6.4 discusses the coping strategies according to the finding from the survey. It also addresses whether the findings are consistent with the sampled theories and the literature reviewed in chapter 2, and whether the study answers the research questions outlined in chapter 1. Section

6.5 discusses the result from the empirical model and investigates the results from the data analysis to test the hypotheses outlined in chapter 3 and examines whether there is significant variation in the coping strategies between infected men and women. Section 6.6 discusses the findings from the focus group discussions, while section 6.7 summarises the findings.

6.2 Data Treatment and Statistical Techniques

The present study calculated the sample size according to a formula based on the estimation of the prevalence of HIV/AIDS epidemic in Sudan, as illustrated in detail in chapter 3. A total of 555 people living with HIV/AIDS were successfully interviewed (refer to Table 3.1). The interviews were conducted during the regular visits of the PLHIV to the VCT/ART centres and hospitals in the study area for counselling, follow up, and treatment. The data from the PLHIV survey was transformed into a suitable format for analysis using the SPSS software. The descriptive statistics analysis focused on the demographic and socio-economic backgrounds of the respondents.

This study used discriminant function analysis (DA) to examine whether there was variation in the coping strategies between the men and women infected by the disease. The DA undertakes the same task as the multiple linear regressions by predicting an outcome. Nevertheless, multiple linear regressions are restricted to cases where the dependent variable on the Y-axis is an interval variable. This means that the compounding of predictors through the regression equation produces an estimated mean population of numerical Y values for given values of the weighted combinations of the X values. According to Agresti (2007), the discriminant analysis is used when:

1. The dependent is categorical with the predictor independent variables at interval levels such as age, sex etc.
2. There are more than two independent variables compared with the logistic regression, which is limited to two independent variables.

This study assigned numerical coding of one (1) for males and two (2) for females for different categories of PLHIV. This method of numeric ranking was developed to manage the data output, to assist in identifying the problems between the two groups and facilitate the comparison process. The F-test was used to examine the variations between the univariate null hypothesis ($H^0: P^1 = P^2$) and the alternative hypothesis ($H^1: P^1 \neq P^2$) for each discriminate variable. Where P^1 represents the population mean for group 1 and P^2 represents the population mean for group 2. The main hypothesis is that there is significant variation in the coping strategies between the affected men and women, which means that the null hypothesis for the variables will be rejected at a significant level of 0.05, meaning the alternative hypothesis will be accepted. It should be noted that variance is the most commonly used measure to describe the set of data and it is directly proportional to the amount of variation or information in the data.

6.2.1 The Empirical Analysis of Discriminant Model

The coping strategies among the affected groups were evaluated using the socio-economic variables, which formed the discriminant function. The following variables shown in Table 6.1 were used to discriminate the coping strategies based on gender groups. The discriminant analysis makes assumptions of the best set of discriminate variables through proportions of statistical tests. These assumptions are that the dependent variables are normally distributed, with the variance of the variables the same (homoscedasticity) and there are high correlations among the independent

variables. A stepwise procedure, Wilks' Lambda λ , is employed as a basis to select the variables that form the discriminant function. The non-standardised discriminant function can be calculated according to the following equation:

$$Y = v_1X_1 + v_2X_2 + v_3X_3 \dots\dots\dots v_nX_n + a \text{ -----6.1}$$

Where Y = Discriminate function

V = The discriminant coefficient or weight for that variable

X = Respondent's score for that variable

a = Constant

n = The number of predictor variables

The objective of the analysis is to identify the weights of $v_1 \dots v_n$ of the first equation that will expand the following equation to explain the coping strategies:

$$Y = v_1 \text{ Saving} + v_2 \text{ Infetill} + v_3 \text{ Assetinf} + v_4 \text{ Occupation} + v_5 \text{ Salary} + v_6 \text{ Educost} + v_7 \text{ Afinfecth} + v_8 \text{ Marital Status} + v_9 \text{ Educulevel} + v_{10} \text{ Borrow} + v_{11} \text{ Afexpend} + v_{12} \text{ Hospital} + v_{13} \text{ Contactf} + v_{14} \text{ Hospcost} + v_{15} \text{ Hospay} + v_{16} \text{ Sourceinc} \dots\dots\dots v_nX_n \text{ -----6.2}$$

Equation 5.1 shows a linear combination of the socio-economic ratio ($x_1 \dots x_n$) for PLHIV in Sudan. The aim is to identify the weight of the variables in the equation by performing this analysis. Based on the equation, the discriminant analysis was performed by using men and women living with HIV/AIDS as dependent variables and the socio-economic coping strategies variables, identified earlier as independent variables. The variable that decreases the value of Wilks' λ , is entered at each step. This stepwise estimation is used to perform the analysis, whilst entering the independent variables. Estimating the discriminant function will help in identifying the minimum discriminant function that provides most of the discrimination power among the different coping strategies for both men and women. The aim is to explain whether there is variation in the coping strategies between the two groups.

Table 6.1 Summary of the PLHIV Survey Data ‘Variables’

Variables	Coding	Description
Saving	1= Have savings, 2 = Do not have savings	Savings for the future after the infection (Saving)
Income	1= Full, 2= Partial 3= None	Still have income after the infection (Infetill)
Assets	1 = Available, 2 = Not available	Assets available after the infection (Assetinf)
Occupation	1= Employed, 2= Not employed	Occupation status (Occupation)
Salary	0 = “none” 1= 150 - 450, 2= 450 - 750, 3= 750 – 1050, 4= 1050 - 1350, 5= >1650 In SDG (Sudanese pounds)	How much is the salary (Salary)
Payment of Education Costs	1= The Patient, 2= Government, 3= Relatives, 4= friends, 5 =others	Payment of educational fees for children (Educos)
Children’s Schooling	1= Yes, 2 = No	Children still in school after their parent infected by the disease (Aftinfec)
Marital Status	1 = Married, 2 = Single, 3 = Widow, 4 = Divorced, 5 = Separated/others	Marital status for both women and men infected for social network structure purpose (Marital Status)
Education	1 = Never, 2= Primary, 3 = Secondary, 4= Diploma, 5 Degree, 6= Masters, 7= PhD, 8= others	Educational level of PLHIV (Educllevel)
Borrowings	1 = Yes 2 = No	Borrowings to cope with the disease costs (Borrow)
Expenditure	1 = Fixed income, 2 = Unfixed income, 3 = Government aid, 4 = Relatives support, 5= friends, 6 =NGOs, 7 = Others	Aspects of living expenditure (Afexpend)
Hospitalisation	1 = Yes 2 = No	Admission to the hospital (Hospital)
Contact of Virus	1 =Husband, 2=Wife, 3= Friend, 4 =Sex worker, 5= Others	From whom does the affected person get the virus (Contactf)
Hospital Costs	1= 0-100, 2= 100-200, 3= 200-300, 4= 300-400 (SDG)	Expenditure per day in the hospital (Hospcost)
Hospital Payments	1= Patient himself 2= Hospital 3= Zakat, 4 =Employer 5= NGOs 6= SNAP,7= PLHIV associations, 8 Relatives, 9= Friends, 10= Others	Who bears the hospital costs (Hospay)
Source of Income	1 = Yes 2 = No	Source of income before the infection (Sourcinc)
Availability of the income after infection	1= Yes “full” 2= Yes “Partial” 3 = None	After infection still have income (Infetill)

Source: PLHIV survey 2011 results using SPSS

6.3 Results

This section details the findings from both the PLHIV survey and the FGDs with infected persons. The findings from the quantitative statistical analysis are combined in a novel framework with the findings from the FGDs in Figure 6.3. This enabled a holistic understanding of different aspects of their lives, including vulnerability to HIV risk and livelihood strategies, accessibility to assets and resources, family relations and social networks.

6.3.1 Demographic and Socio-Economic Characteristics of the Respondents

This section discusses the demographic and socio-economic characteristics of the respondents. The summary statistics of the demographic characteristics of the respondents are shown in Table 6.2. It was essential that the respondents provided their background characteristics before carrying out the analysis to allow the researcher to identify the group dynamics. The purpose of this survey was to collect valid information to provide evidence on the socio-economic situations of PLHIV in Sudan.

6.3.1.1 Distribution of Respondents by Age, Sex, Religion and Education

Table 6.2 shows the distribution of the respondents by demographic characteristics such as age, sex, religion, marital status, and education. The proportions of the respondents who were interviewed by gender revealed that about three-fifths of the respondents were males (59.6 %) while the rest were females (40.4%). The counsellors working at the VCT/ART centres explained this disparity as owing to the obvious fact that females were more unlikely to come to the centres due to the stigma attached to HIV. Most times, the infected females delegate their relatives to take the drugs for them. The survey results also show that the majority of the respondents were

Muslims (81.4 %), while the rest were Christians (18. 6%). This could be explained by the fact that Sudan has much more Muslims than Christians after separation from the Republic of South Sudan.

The results show that AIDS mainly affects people in the productive age group of 15-49 years (97%). Sadly enough, here lies those on whom the society relies to carry out productive works, such as crops production, work in industries and on land, run schools and hospitals among other productive roles. Hence, when an adult or breadwinner becomes ill or dies from HIV, the household income declines. Loss of labour is encountered not only because the affected individual is unable to work, but also because the time and disposition of other members of the household are diverted to care for the sick. This age group is also the most sexually active with respect to HIV risk behaviours.

The distribution of the respondents by educational background show that more than half (51.2%) of the respondents had no schooling at all or were educated up to the primary school level, while 35 percent were educated up to secondary school. About 3.2 percent had diplomas and only 0.9 percent were educated up to university level. The percentage of respondents with a Master's degree was 0.9 percent and those with a PhD degree was 0.7 percent.

Table 6.2: Demographic characteristics of The Respondents from PLHIV Survey

Variables	Description	Frequency	%
Area	Rural	364	65.65%
	Urban	191	34.4%
Sex	Male	331	59.6%
	Female	24	40.4%
Age	16 – 25	59	10.6%
	26 – 35	211	38.0%
	36 – 45	194	35.0%
	46 – 55	78	14.1%
	56 – 65	13	2.3%
Education level	None	127	22.9%
	Primary	157	28.3%
	Secondary	194	35.0%
	Diploma	18	3.2%
	Degree	50	9.0 %
	Master	5	0.9%
Religions	PhD	4	0.7%
	Muslim	452	81.4%
	Christian	103	18.6%
Marital Status	Married	299	53.9%
	Single	151	27.2%
	Widow	65	11.7%
	Divorced	40	7.2%
Occupation	Student	24	4.3%
	Jobless	79	14.2%
	Soldier	29	5.2%
	Housewife	143	25.8%
	Government Employee	46	8.3%
	Driver	39	7%
	Business man (woman)	36	6.5%
	Daily worker	142	25.6%
	Others	17	3.1 %

Source: PLHIV survey 2011 results using SPSS

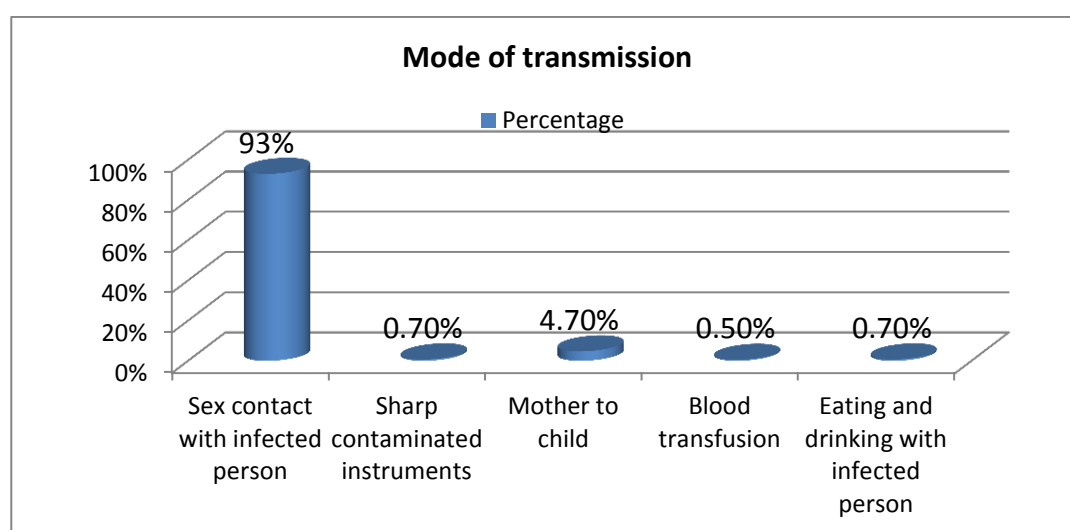
6.3.1.2 Distribution of Respondents by Marital Status and Occupation

Table 6.2 shows that 53.9 percent of the respondents were married, 27.2 percent were single, 11.7 percent were widowed, and 7.2 percent divorced. The literature argues that since women are economically dependent on their husbands or partners (Masanjala, 2007). The economic effect on the widows and divorced women could be devastating as they loss virtually all income due to loss of the men and breadwinners. The percentage distribution of the respondents by occupation showed that more than 25 percent had marginal jobs as daily workers, 25.8 percent were housewives and 14.2

percent were jobless. This indicates a lower economic status among the majority of infected person.

6.3.1.3 Distribution of the Respondents by Mode of Transmission

The main mode of HIV transmission in Sudan is sexual intercourse and this account for about 97 percent of transmissions (SNAP, 2010). The survey findings confirmed this, as 93 percent of the respondents stated that the virus was transmitted to them through sexual contact and only 0.5 percent mentioned that the virus was transmitted to them through blood transfusion (see Figure 6.1).

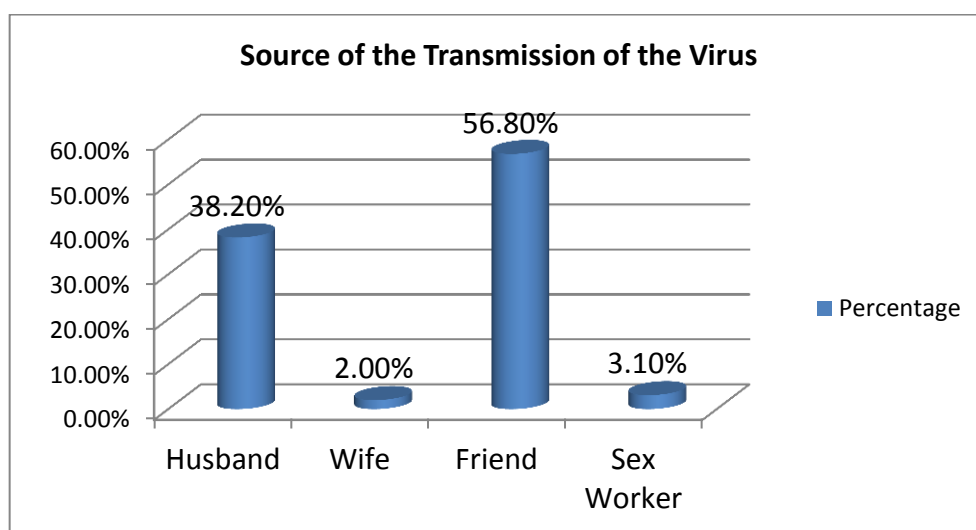


Source: PLHIV Survey 2011 Analysis Results

Figure 6.1 Mode of Transmission of HIV Virus

Among the infected women, 38.2 percent claimed being transmitted by their husbands, while only 2 percent of men reported getting the virus from their wives. Further, 56.8 percent of the men said that they were infected by their girlfriends and 3.1 percent were infected by female sex workers (see Figure 6.2). These results were consistent with other studies that concluded that poor women were particularly

vulnerable to HIV due to a lack of power to negotiate sex with either husbands or partners (Moore & Oppong, 2007; Walker, 2002; Waterhouse & Vifjhuizen, 2001).



Source: PLHIV Survey 2011 Analysis Results

Figure 6.2: Source of the Transmission of the HIV Virus

According to the findings of this survey, when the respondents were asked if there were any other members in their households who had contracted the disease, it was attested by them that some of their relations were also affected, going by calculation the amount infected was 205 individuals. The average of the other affected persons within each household was 0.6, and ranges between 1-4 people per household. These results also show increased prevalence of the disease and its extra burden.

6.3.1.4 Economic Background of the Respondents

Providing the demographic and socio-economic background characteristics of the respondents illustrated the various economic indicators at hand before carrying out the data analysis. Individuals infected by HIV are often vulnerable to poverty through limited resources, social insecurity, and economic shocks. This can result in various

dimensions of poverty together with the other members of the household as the result of the cost of the disease and aggravated poverty situation among the infected people. Before the infection, the majority (83.5%) of the respondents had no savings for the future; while the remaining 16.5 percent had savings (see Table 6.3). After the infection, 89.1 percent of the respondents had no savings for the future. This indicated that the savings rate was expected to fall as the incidence of the disease rose, thereby increasing the expenditures on HIV/AIDS-induced illnesses.

When the respondents were asked about their borrowings, more than two-thirds (415) accounting for 79.6 percent of the respondents said that they borrowed either from friends, relatives or employers. In line with Li Li (2006), this indicated that an increasing number of respondents depended on borrowings for high treatment costs of the disease due to unstable and low income. People are considered poor if their income is below the poverty line defined as US \$1 per day (World Bank, 2001). This is equivalent to three Sudanese pounds per day or 90 SDG per month during the period of the survey. The majority of the respondent has no formal income (63.1%) and most of the salaries ranged from 150 to 750 SDG per month which indicates low income for PLHIV (see Table 6.3).

Table 6.3: Income and Coping Mechanisms of PLHIV

Variable	Frequency	Percent (%)	N
Do you have any source of income			
Yes	167	30.1%	555
No	388	69.9%	
Do you have savings for the future			
Yes	89	16.5%	539
No	450	83.5%	
If yes, in what form			
Bank account	18	18.6%	97
Assets	79	81.4%	
After the infection, do you still have savings			
Yes	58	10.9%	533
No	475	89.1%	
After the infection, you still have assets			
Yes	178	32.1%	555
No	377	67.9%	
If no, did you borrow			
Yes	411	79.6%	555
No	97	20.4%	
Source of Borrowing			
Friends	151	35.4%	426
Relatives	217	50.9%	
Employer	40	9.4%	
Others	18	4.2%	
Salary (SDG)			
None	63.1%	350	555
150-450	20.7%	115	
450-750	12.8%	71	
750-1050	1.8%	10	
1050-1350	0.4%	2	
1350-1650	0.9%	5	
1650>	0.4%	2	

Source: PLHIV Survey 2011 Analysis Results

Table 6.3 shows that neighbours and friends were another source of support to individuals and families during crisis, this in line with Tladi, (2006). More than half of the respondents (50.9%) reported receiving financial support from relatives and 35.4

percent borrow from friends and neighbours. In addition, members of the extended family were sources of potential support. Cash remittances by family members clearly indicated the existence of social networks that extend beyond face-to-face interactions. The act of lending money for medical expenses and other purposes was another way of affording assistance by friends and neighbours. In Sudan, though the social network assists families with AIDS patients in coping with its impact, poor households are still unable to extend any material support, thereby increasing the burden of the disease among infected people.

6.3.2 Coping Strategies among People Living with HIV/AIDS

This research describes the multiple complexities of surviving with HIV/AIDS. In order to understand the financial responses of the affected individuals due to changes in the household's economic situation, it is necessary to look at the differences before and after the infection in terms of current levels of savings and debt. This section discusses whether the findings from the primary survey and FGDs among PLHIV in Sudan were consistent with the assumptions of the theories adopted in this thesis, particularly the livelihood theory. This theory discusses the coping mechanisms and strategies adopted by people to deal with risks and uncertainties.

To recognise what is happening in the households infected by the disease, it is important to identify and ascertain the social and economic impacts of HIV (Barnett, T. et al., 2001). In addition, morbidity and mortality are increasing rapidly due to HIV/AIDS resulting in additional pressure on households in their struggle for survival (Dorrington et al., 2001). Deprived households are often the worst struck and more susceptible to the long-term effects of HIV/AIDS and poverty (Mwambete & Justain, 2011). This section discusses the dynamics that arises when HIV affects the household.

6.3.2.1 Negative Consequences of HIV/AIDS on Income and Expenditure

Financial constraints, loss of jobs, and inheritance rights were significant themes in the study among PLHIV in the FGDs. Table 6.4 shows the results of the t-test, indicating that the proportion of AIDS-impacted persons had numerous observable changes in their source of income and expenditure before the infection and at the time of the interviews. The results show that expenditure before the infection from the patient's own income was 59.3 percent and external support 40.7 percent, while after the infection expenditure reduced to only 12.3 percent and external support 87.7 percent.

Table 6.4

Changes in Income and Expenditure of PLHIV

Variable/ household Source of income and expenditure	Mean before the infection	Mean after infection	P Value
Source of income	61.01	18.86	0.000***
Source of Expenditure	2.01	3.21	0.002***
	(patient own source)	(relatives support)	

Note: * weakly significant at $p < 0.1$; ** significant at $p < 0.05$; *** significant at $p < 0.01$
Source: PLHIV Survey 2011 Analysis

The outcomes of the statistical tests (one-tailed) indicated variation in proportions between the 'before-impact' and 'after-impact'. The income values were significantly lower for the households at the time of the interview "after the infection". The majority of infected persons had limited income before the infection and expenditures increased after the infection.

The results show that the reported expenditure was greater than income for the infected persons, suggesting that the population is forced to live beyond its economic capability. This is true for those households affected by HIV and faced with huge

expenditures in healthcare, treatment and nutrition, as pointed out by Batteh et al. (2008). As a result of the impact of HIV/AIDS on household economics, poverty is likely to deepen as the epidemic takes a deeper course. The short-term survival needs usually force women, who lack the strong heart to see their dependents bear very excruciating conditions, to develop a range of coping mechanisms with varying long-term consequences on their health and prosperity.

Moreover, the findings of the study suggested that HIV/AIDS has a huge impact on the household income and expenditure in various ways. For instance, when the household labour forces supply changes due to AIDS morbidity and mortality, there is severe decline in household income (Thirumurthy et al., 2008). Subsequently, household spending may rapidly increase following illness or death, as households need to spend more on healthcare and burials respectively. Thus, HIV/AIDS appears to significantly deepen the poverty status amongst the poorest affected households. These findings were consistent with several studies that described the burden of morbidity and mortality over time (Mahal et al., 2008; Blacker, 2004; Dorrington et al., 2001, Rodtgo & Rajapaks, 2010).

Most of the participants in the FGDs maintained that they had to resort to selling their assets to cope with the death of the breadwinner of the family. An adult woman mentioned that the main assets that had to be sold were goats, furniture, clothes, televisions and refrigerators. The discussions also show how coping mechanisms become increasingly difficult as more households in a community are affected with weak communal support networks.

The quantitative and qualitative findings of this study show that PLHIV in Sudan faces grave economic challenges to address their commitments and engage in a wide-range of coping strategies to offset medical costs, including depleting savings, borrowing money from relatives, friends and neighbours, disposing hard earned

household assets and properties, and increasing debts. All these have severe effects on employment and education for the children and other dependents. This includes children being forced to leave school and join the job market to generate income and take care of sick members. UNICEF (2012) reported that 14 percent of boys and 12 percent of girls engaged in child labour in Sudan.

6.3.2.2 Coping with Income and Savings

On attempting to escape the consequences of impoverishment and deprivation, households may adopt different types of actions and strategies to deal with these situations. Such actions and strategies include withdrawal on savings, disposed assets and use assistance from relatives, government agencies and non-governmental organisations (Tladi, 2006). The HIV/AIDS epidemic constrains the ability of the households to cope with shocks (Slater & Wiggins, 2005).

The analysis shows that households generally adopt any, or a combination of three coping strategies as their income and expenditure changes. They either “borrow”, “utilise savings”, or “sell assets” as a coping strategy. In order to cope with the financial pressures of increased medical care expenses, the affected households apply pecking order in adopting coping strategies. First, they dispose their savings and assets before borrowing from other sources. The findings were consistent with many related studies (Marzo, 2004; Masanjala, 2007). This makes sense, considering the fact that the poor households would be further exposed to extreme poverty if they start with borrowing. In most cases, they may find it difficult to borrow significant amount due to their status.

The finding from the PLHIV survey show that 67.9 percent of respondents had at some point sold one or more household assets in direct response to AIDS morbidity. Even though the respondents owned a small number of assets, they were willing to

exercise this difficulty and dispose them to increase their finances in response to the crisis they faced. In fact, the respondents generally preferred to utilise their savings before opting the dispose of their assets.

The assets sold were mostly consumable goods like radios, televisions, and telephones. The crux of the matter is what happens when all the consumable assets are sold. The implication in the future is that such households must be at risk as they can no longer generate and/or maintain household income. With time, these households become exposed to poverty and impoverishment due to the loss of such assets and may reach a point where economic recovery tends to be impossible. For instance, in rural households where agriculture is the most dominant activity, having sold all productive assets such as agricultural equipment and livestock and their products, such household may resort to selling implements tools that help them in their daily work. This will accelerate their poverty.

These economic impacts illustrate the difficulties experienced by PLHIV and their households, in developing and retaining the income levels, which is essential to cope with the disease and stigma. In summary, the study shows that PLHIV and their families bear a substantial burden of stress, illness and death associated with severe poverty. Studies similar to this have been carried out in South Africa, Nigeria and Kenya with the same results (Ha Noi, 2005; Steinberg et al., 2002; Mahal et al., 2008; Bachmann & Booyson, 2004). The coping mechanisms illustrated by PLHIV from the survey and the FGDs indicated that different obstacles often overlap in conjunction to exacerbate the constraints to meet increased medical care costs.

6.3.2.3 Care Giver and Medical Services

As soon as the HIV-infected individual develops symptoms, the highest direct cost to the household may be hospitalisation costs as a result of treatment and care. (Schoeman & Pather, 2009). The survey results displayed in Tables 6.5 and 6.6 show that the majority of the interviewed patients visited the healthcare centres mainly public hospitals, to obtain medical treatment and approximately half of them admitted to hospital (46%). The duration of their hospitalisation ranged from one month to one year. The median hospitalisation stay was between one to two months for about 250 of the patients (slightly less than 50% of the participants).

More than half of the respondents (55.4%) had their medical expenses taken care of by relatives, indicating a strong social network and increased dependent persons (Li Li, 2006). Approximately 16.9 percent of the respondents covered the expenses on their own. However, 12 percent mentioned that the government covered their medical treatment expenses.

Table 6.5: Duration and Expenditure on Hospitalisation

Variable	Frequency	Percent (%)
Have you been hospitalised before infection		
Yes	244	46.0%
No	287	54.0%
If hospitalised for how long (per month)		
One	163	65.2%
Two	46	18.4%
Three	21	8.4%
Four	5	2.0%
Five	2	0.8%
More than five	15	6.0%

Note: Median hospitalisation (IQR) of 250 PLHIV: 1 (1 – 2)

Median expenditure per day in hospital (IQR) of 555 PLHIV: 99 (60 – 99)

Source: PLHIV survey 2011 results using SPSS

Table 6.6: Source of Payment of Medication

Variable	Frequency	Percent (%)
Who pays for the hospital expenditure		
Yourself	42	16.9%
Hospital	30	12.0%
Zakat	11	4.4%
Employer	6	2.4%
NGOs	1	0.4%
SNAP	4	1.6%
PLHIV association	8	3.2%
Relatives	138	55.4%
Friends	8	3.2%
Others	1	0.4%

Source: PLHIV survey 2011 results using SPSS

6.3.2.4. Coping with Children's Education

The negative impacts of HIV/AIDS included children taken out from schools and forced to work to generate extra income (Gillespie et al., 2007). Most of the interviewed AIDS patients reported that their children were not attending school. Table 6.7 shows that the main reason behind such children dropping out of school was their inability to pay the cost of schooling. When the respondents were asked whether their children were still in school after the infection, 58 percent mentioned affirmatively, while 45.4 percent responded negatively.

Table 6.7: Children's Education

Variable	Frequency	Percent (%)
Have children		
Yes	351	63.1%
No	65	11.7%
Children's Education		
Children in school (before the infection)	322	58.0%
Children in school (after the infection)	252	45.4%
Payment of education expenses		
Patient	106	19.1%
Government	11	2.0%
Relatives	202	36.4%
Friends	5	0.9%
Others	25	4.5%
Reasons children not in school after the infection		
Not enough income	126	22.7%
Care for sick dependents	10	1.8%
Work to generate income	24	4.3%
Others	3	0.5%

Source: PLHIV survey 2011 results using SPSS

When the respondents were asked about payment of educational expenses, 19.1 percent mentioned that they paid the expenses. For those children kept in school, 36.4 percent of the respondents reported that their relatives shoulders the educational expenses. Approximately 4.5 percent mentioned others and only 2 percent mentioned government aid. This meant that even the 58 percent who had their children in school face shortage of income to pay the school expenses and depended on external assistance.

When the respondents were asked the reason why their children were not in school, 22.7 percent mentioned lack of income, 4.3 percent mentioned that they needed their children to work to generate income to help their families, and 1.8 percent mentioned that their children take care of sick members of the household. The results indicate that children were forced to leave school and join the job market due to a

decline in the family's income occasioned by increased health expenses and reduction in income for other needs.

6.3.3 The Results of the Empirical Analysis of Discriminant Model

In many ways, gender inequality was a key contributor to vulnerability of the HIV/AIDS epidemic. The results of the univariate analysis are presented in Table 6.8. The F-test highlighted significant difference in the coping strategies among the men and women to deal with the impact of the disease. This difference is attributed to variables such as salary, cost of education for children, level of education, children in school after infection, having income after infection, hospital admission, source(s) of income after infection and marital status. Table 6.8 also shows significant difference in the means between the two groups.

Table 6.8: Coping Strategies between Infected Men and women

Variables	Men mean	Women mean	Total mean	Wilks' lambda	F	Sig.
Savings	5.08	4.02	4.65	0.999	0.553	0.457
Still have income after infection	75.05	51.43	60.97	0.940	34.938	0.000
still have assets after infection	83.02	82.36	82.75	1.000	0.043	0.836
Occupation	6.46	7.54	6.89	0.998	1.181	0.278
Salary	235.52	147.37	199.91	0.963	20.945	0.000
The burden of education cost	64.41	40.38	54.70	0.940	35.062	0.000
Children still in school after infection	55.30	26.21	43.55	0.913	52.294	0.000
Marital status	1.61	1.86	1.71	0.982	9.917	0.002
Religions	1.18	1.19	1.18	1.000	0.160	0.689
Education level	2.66	2.33	2.53	0.983	9.636	0.002
Borrowing	9.25	8.65	9.01	1.000	0.069	0.793
Expenditure after infection	3.65	2.57	3.21	0.997	1.379	0.241
Mode of transmission of the virus	1.75	1.18	1.52	0.998	1.226	0.269
Admission to the hospital	7.18	2.39	5.24	0.984	8.860	0.003
Source of transmission of the virus	9.39	7.03	8.44	0.998	1.335	0.248
Payment of hospital cost	89.87	92.12	90.78	0.999	0.403	0.526
Source of Hospital payment	59.67	53.75	57.28	0.996	2.165	0.142
Source of income	29.75	11.33	18.77	0.939	35.504	0.000

Note: Infetill (Still have income after infection); Asstinf (still have assets after infection); Educus (The burden of education cost); Afinfecf (Children still in school after infection); Maritas (Marital status); Edulevel (Education level) Afexpend (Expenditure after infection); (Mode of transmission of the virus); Hospital (Admission to the hospital) Contactf (Source of transmission of the virus); Hospcost (Payment of hospital cost); Sourcinc (Source of income).

Source: PLHIV Survey 2011 results using discriminant function analysis

The results show that in terms of keeping children in school after the infection (Afinfecth), women were less able to retain their children and /or wards in school and ensure the continuation of their children's schooling in relation to their male counterparts (26.21 for women to 55.30 for men), as they faced challenges in paying the school fees. This shows low earnings and lack of job opportunities for women owing to prevalent norms related to femininity in most African countries.

In terms of salary, the findings show that the variation was very high, (147.37 for women to 235.52 for men), indicating that higher numbers of men were engaged in formal employment, ensuring a better level of income, which in turn allowed them to cope better with the stress of the disease. For women, they were challenged with low employment rates and low socioeconomic status, rendering them more vulnerable to the negative impact of the disease. Women, especially those widowed and divorced faced financial constraints due to loss of their breadwinners. Furthermore, due to cultural unfounded beliefs, women in Sudan have less income because they lack access to some types of jobs, resulting in lack of appropriate healthcare and affordable health insurance.

With regard to marital status, the findings show that married women infected with the disease (1.86 for women to 1.61 for men) were better able to cope with the psychological impact of the infection in comparison to their male counterparts, reason being that the majority of married women tended to stay at home as housewives, therefore having little interaction with persons outside of their community. However, this could only explain the situation of stay at home married women, as those who married and have a job, may found difficulty to cope.

In addition, families may share in the burden of providing economic, emotional, and psychological support. Thus, women are found to be dependent on their relatives for social and economic support. Moreover, local service providers and social support provides concerns that are more specific to women affected by HIV and AIDS to help them cope with its impact; the most obvious of which relate to children (Li Li, 2006; Tladi, 2006). Some poor married in rural areas, were economically and socially dependent on men. This helps them to cope better, as they will shift the responsibilities to their husbands (Attwood, Castle, & Smythe 2004; Masangala, 2007).

On the other hand, married men were found to be more commonly engaged in formal employment and were in turn more exposed to stigma and discrimination from

fellow workers and colleagues. In addition, the disease can take a greater toll on men due to the role they play as the family heads where in some cases they are the sole breadwinners. The sense of incapacitation and being unable to meet their family needs and commitments increases their stress levels greatly.

In terms of hospitalisation, the results indicated that men were able to cope better with the burden of healthcare costs than women (7.18 for men to 2.39 for women) due to differences in income status. In addition, men had a higher level of education than women (2.66 for men to 2.33 for women) hence making them better able to afford educational costs of their children in comparison to women (the ratio for this latter was 64.4 for men to 40.4 for women).

In terms of source of income before the infection (sourcing) and source of income after infection (infectil), the mean for men income was larger than that for women (75.05 for men to 51.43 for women) and (29.75 for men to 11.33 for women) respectively. This is a strong indication that men have higher income placing them at an advantage and stronger footing when coping with the impact of the disease. This is in line with the documented literature which asserts that men have more access to formal employment as well as income generating activities (Suda, 2002).

The remaining variables show no significant differences between the two groups in coping with the disease burden. The inference can thus be drawn that men and women who coped with the impact of the disease do not behave differently in terms of variables such as selling of assets, use of personal/household savings, or in regard to borrowing money to meet the increasing health services demands that accompany the disease.

This study suggests that the impact of HIV/AIDS is more critical on women compared to men. Socio-economic factors and cultural values place men in a more favourable position for coping with the impact. In their roles as mothers and care

providers, women are mainly responsible for taking care of HIV/AIDS patients in the home, in addition to other productive and domestic tasks.

Moreover, the findings suggest that women are more burdened by the economic impact of the disease mainly in terms of income, according to SHHS 2010, 56.9 percent of household headed by women are below the poverty line, compared to 48.1 percent of men. There is urgent need to boost the educational and economic opportunities of women and young girls in rural areas. This will reduce HIV transmission by providing alternatives to commercial sex. It will also contribute to sustainable rural development and remarkable improvement in the status of women in the patriarchal society. Advancements on the social variables of education, empowerment of women and human rights protection are urgent important factors in reducing overall societal vulnerability to HIV and mitigating the impact of the disease as well, and that of women in particular. These are as well critical in their own rights.

Table 6.9 shows that the first variable entered in the model was the ‘aftinfech’ (children still in school) variable, followed by four other variables. It should be noted that Wilks’ λ statistics decreased as each step was computed. The discriminate variables presented in Table show a high degree of significance variation. It should be further noted that the criteria to enter or remove the variables from the function is based on Wilks’ λ and the tolerance level of 0.001.

Table 6.9 indicated empirical evidence regarding the variations of the coping strategies among the men and women in terms of source(s) of income after the infection, having income after the infection, the costs of schooling for children and hospitalisation. These variables were important in determining the coping strategies between the two groups.

Table 6.9: Variables Constitutes the Discriminant Function

Step	Entered	Statistics	Wilks' λ
1	Children still in school after infection	0.913	0.000
2	Still have income after infection	0.856	0.000
3	Marital status	0.817	0.000
4	Source of income after the infection	0.791	0.000
5	Admission to Hospital	0.784	0.000

Source: PLHIV Survey 2011 results using discriminant function

Table 6.10 provides an index of the importance of each variable similar to the standardised regression coefficients (Beta) and the multiple regressions. The signs indicate the direction of the relationships. The variations indicate that the two groups differ significantly in terms of the five variables highlighted in the table. The source of income and its availability after the infection was the strongest predictor, followed by marital status. These three variables with large coefficients stand out as those that strongly predict the coping strategies between the two groups. Hospitalisation and children's schooling defect after infection (afinfech) scored less successfully as predictors (note: –ve sign). The study suggests the role of strong social network in Sudan, as relatives and friends play major roles as coping mechanisms.

Table 6.10: Structure of Matrix

Variables	Function 1
Children still in school after infection	-0.587
Still have income after infection	0.480
Marital status	0.256
Source of income after the infection	0.484
Admission to Hospital	-0.242

Note: Pooled within groups correlations between discriminant variables and standardised canonical discriminant functions. Variables are well-ordered by absolute size of correlation within function.

Source: PLHIV Survey 2011 results using discriminant function

Gender plays a key role in the complex interplay between HIV/AIDS – related stigma, moral judgment, shame and blame. The results show that, women either married or single, divorced, widowed, sex workers, seasonal migrants or adolescent girls alike, are all susceptible to the negative impacts of HIV and AIDS. The findings from the FGDs prove that women face many challenges in their livelihoods, including the burdens of the impact of the disease. They also undertake a larger burden of their domestic responsibilities and make maximum effort to care for their family and other dependents. In addition, when women are informed of their HIV-positive status, their concerns are mostly focused on caring for children rather than the effects of the disease on their personal health. Further, they are more likely to be kept out of school to either help in the household chores or care for the dependents because of the inability to pay for school fees.

The results of the discriminate function model in Table 6.8 show that HIV/AIDS led to impoverishment and higher adult morbidity and mortality. The quantitative results indicated that men and women experience the impact of HIV/AIDS differently. The results of the model analysis model showed that women were less able to cope with the impact of the disease in terms of income before and after the infection, children's

educational costs, and hospitalisation costs. Moreover, they were less employed than men. Regarding other coping mechanisms such as selling assets, borrowing and using their savings, the results found no variation between men and women in dealing with their assets and using their savings to face healthcare expenses. The results indicated that PLHIV preferred to use their savings first then intended to sell their assets and borrow. The majority of the respondents in the survey borrowed money mainly from their relatives.

Women especially those widowed and divorced faced financial constraints due to loss of their infected breadwinners. Furthermore, due to cultural unfounded beliefs, women in Sudan have less income because they lack access to some types of jobs. This makes women less productive than male-headed households resulting in lack of appropriate healthcare and affordable health insurance leading to increased female suffering. Socio-economic factors and cultural values placed men in a more favourable position to cope with the impacts than women.

The focus group discussions among PLHIV show that stigmatisation due to HIV/AIDS is a problem for both the affected men and women. However, due to socio-cultural factors women are more likely to be stigmatised than men. This situation originates from women's inferior position in the highly patriarchal society such as Sudan.

The results in chapter 6 reveal that approximately 50 percent of the PLHIV in the survey were admitted to the hospital. It further reveals that HIV/AIDS patients had significantly higher sick days, higher healthcare and treatment expenses than general populations. Finally, HIV/AIDS has been shown to decrease wealth and hence aggravate poverty. From a policy perspective, the findings provide an indication of priorities in terms of designing interventions aimed at mitigating the impact of HIV/AIDS in Sudan.

6.4 Qualitative Findings – Focus Group Discussions among PLHIV

The objectives of the FGDs conducted among PLHIV were to obtain in-depth understanding of their coping strategies due to HIV and to supplement the information gathered from the primary survey. This study conducted a purposive sample size of 30 people living with HIV/AIDS in Sudan. The participants were selected in close collaboration with the Sudan National AIDS Control Program and PLHIV association. The participants selected represent all 15 states in Sudan with mixed gender groups. The FGDs conducted during the period between 2nd to 29th November 2011. This section begins by presenting the demographic characteristics of the respondents.

6.4.1 Demographic Characteristics of the Respondents from the FGDs

All the participants shared common characteristics such as age, sex and socio-economic characteristics. Distribution of respondents by gender shows equal distribution for both males and females with 50 percent each. Approximately fifty percent (46.6%) were married, of which 40% were unemployed and 33.3 having marginal jobs. Approximately 59.9% were either uneducated or has primary education. Overall, the entire sample was of low socio-economic status (See Table 3.3 in chapter 3).

6.4.2 Qualitative findings – Themes

Attempts were made to study the coping strategies and mechanisms adopted by PLHIV. A variety of topics was discussed with the FGDs participants to achieve the objectives of this study. The topics discussed include experiences with HIV from various perspectives, major factors aggravating their problems, services offered from healthcare providers, acceptance by the community, and their job status after the infection. The topics discussed are shown in Appendix (D).

Table 6.11 presents a synthesis of the socio economic impacts and coping strategies that were described by PLHIV during the focus group discussions. The Table includes detailed examples from the study in the form of quotes taken from the qualitative data. It also refers to relevant quantitative data from the PLHIV survey. These have been categorised into two main themes, financial and social constraints. The coping strategies were perceived at the levels reflected. The financial and social constraints included income, savings, employment, health expenses, stigma, and social relations within the community. The themes included basic, economic, social, psychological and spiritual needs. The main coping strategies were outlined within these categories

The qualitative data from the FGDs was interpreted and organised into different themes in line with the livelihood theory, and based on their experiences and coping with the disease. These themes were then related to the study questions and the objectives. The themes were:

- (1) Human capital impacts, which included education, skills and knowledge constraints and support; nutrition and healthcare expenses (medical and funeral expenses incurred by the household due to increased illness and eventual mortality of the AIDS-infected individual);
- (2) Financial, natural and physical impacts, which included income, goods and land ownership; savings, borrowings and sale of assets (e.g., vehicles and houses); and
- (3) Social capital impacts which included social networks coping with stigma and gender discrimination.

Table 6.11
Coping Strategies among PLHIV in Sudan

Coping Strategies	Quantitative and Qualitative Findings
Financial constraints	
Income Source of income Payment basis	<p>Participants in the survey mentioned that, after the infection they did not have a source of income or had partial income. Those who were paid on a daily basis received only partial income due to their sickness, as they were unable to work.</p> <p>A 39 years old widow said, <i>“My husband died and left me with three children and without any source of income. I worked as a daily worker in school, with very little money to feed my children. My family is poor and cannot afford to support me.”</i></p> <p>A young 28 years old man said, <i>“Financial conditions is very bad, if any girl or woman provided me with at least 200 SDG (equal to 40 dollars) in order to practice sex with her, or engage in any risk behaviour, I will not refuse, and will not disclose my HIV infection and illness to her, due to reduction in my total income.”</i></p>
Employment	<p>The distribution of respondents by occupation showed that majority of the respondents were daily workers, housewives and the rest were jobless.</p> <p><i>“I was working in Saudi, when the government decided to improve workers situation. As a result, the government did different medical investigations including HIV tests, so I found myself HIV+, and was immediately sent back to Sudan. I lost everything, including my job, and assets.”</i> (46 years old man)</p> <p><i>“My family was large, which included my husband and seven children. I was living in Gezira State (Central Sudan). Before the infection, my husband was working in a petroleum producing country, and our financial situation was good. After the infection, my husband lost his job and returned to Sudan. Our household was affected and we underwent extreme financial difficulties due to loss of income.”</i> (44 years old woman)</p> <p><i>“After the infection and loss of my job as an employee of a foreign embassy, the household’s financial situation became difficult. I relied on the income from my father’s old age government pension and a sister, who was employed as a domestic worker nearby.”</i> (42 years old man)</p>
Savings Still have savings	<p>A 38 years old man said, <i>“When faced with the costs associated with sickness, I coped by using up my savings, borrowed money, and took additional loans to pay for the healthcare expenses due to loss of my job as I did not have the benefit of a health insurance.”</i></p> <p>Before the infection, respondents in the PLHIV survey had savings for the future. After the infection, majority did not have savings as the problem worsened.</p> <p><i>“Due to loss of my job, I started using my savings for my healthcare expenses. Due to the continuous illness and frustration, because of the stigma, I tried to get money to fulfil my needs day by day.”</i> (38</p>

	years old man)
Healthcare expenses Who pays Social assistance government inaction	<p><i>“As my immune system compromised with my body, I was infected with Tuberculosis, which required continuous treatment besides my HIV infection. The average duration of admission was 20 days, at (about 4000 SDG) US\$ 1000. I could not bear this so I tried to seek assistance from my relatives and friends, but they also suffered. The living expenses in Sudan became more difficult.”</i> (49 years old man)</p> <p>More than half of the respondents reported that their relatives and friends covered the expenses for their medication.</p> <p><i>A 42 years old man stressed “ we are not benefit from the health insurance, the treatment cost increases rapidly, the government should help us on that”</i></p>
Assets and borrowings Still have assets Selling assets Source of borrowings	<p>A 49 years old man said, <i>“I was living with my wife and children in town. I had few assets and faced financial pressures so I was forced to sell my household assets and borrow to meet my family needs.”</i></p> <p>Majority of the participants in the survey mentioned that they sold their assets to meet their health costs.</p> <p>A 42 years old woman stressed, <i>“In the months and years after the infection, my husband’s ability to earn income was reduced and we were forced to sell our additional assets, borrow, and search for new sources of income.”</i></p>
Children’s Schooling Children still in school Why children not in school Reasons	<p>A 49 years old man stressed, <i>“I am not able to work as before as I feel sick most of the time. It is heart breaking at times when one of my daughters comes along requesting for exercise book and I do not have enough money to buy her one, or they are sent back home for, not having paid the school fees.”</i></p> <p>While the main income came from her husband who worked as a domestic worker (driver), a 46 years old woman said, <i>“The car was not his own as he worked under the owner who provided him with daily cash. The rest of money was used to feed our children. He also paid the schooling expenses for his five children and university fees for his eldest daughter. Recently, about one year ago, one of his sons (14 years old) tested HIV+. This made our lives more difficult.”</i></p> <p>When respondents were asked the reasons their children were not in schools, 22% mentioned shortage of income and 4.3% mentioned that they needed their children to work to generate income so as to help their families.</p> <p>A 48 years old woman said, <i>“... my eldest son was taken out from school to reduce expenses as medical costs rose and he was encouraged to work to supplement the household income.”</i></p> <p><i>I have two girls (13 and 15 years old) and I plan to take them out from school and push them into marriage to reduce our expenditure. We cannot afford the school fees for them anymore.”</i> (45 years old woman)</p> <p><i>For a while my children were unable to attend school because the tuition fees could not be paid, but later after getting support from my friends and relatives they continued their schooling, but I was still</i></p>

	<i>very concerned about the future.” (42 years old man)</i>
Social Constraints	
Stigma	<p><i>“With increasing HIV-related ill-health and stigma we were unable to make choices to improve both the health and happiness of ourselves and our family. A HIV-positive woman who sells goods may find that people may avoid her stall or shop, and not all of them showed their affection towards people like me, so I kept it a secret. Only closed relatives knew about me.” (50 years old woman)</i></p> <p><i>A 42 years old man stressed, “.....due to the stigma, my child of 4 years was forbidden to enter one of the baby care centres in Khartoum state.”</i></p> <p><i>“I did not disclose my infection to anyone. Even my children did not know about my status. I am afraid to tell them because I think they will be confused and may hate me. My elder sister died because of morbidity due to the infection. She was treated very badly and her children suffered and were shamed because of her HIV infection. This was the reason I did not tell anybody about my status.” (49 years old woman)</i></p> <p><i>“I was living with my small family in a rented house. When our neighbours came to know about our HIV infection, they stopped visiting us and we were stigmatised due to our infection. We were forced to leave for another place (Khartoum state) where nobody knew our status.” (38 years old man)</i></p> <p><i>“After my wife died, I became increasingly conscious that my previous sexual behaviour was a subject of discussion and that I was accused of transferring the virus to my wife. My perception seemed to be well founded. Home-based care volunteers and neighbours make stories about my past escapades and extra-marital relationships. They were highly critical, some even suggesting that my poor health status was ‘deserved’. As I was so sick I felt no support and was stigmatised because of my wife’s death, my poverty status” (46 years old man)</i></p> <p>The stigma, discrimination, and isolation meant that people did not easily disclose their diagnosis, which accelerated the prevalence of the disease without interventions. See comments below:</p> <p><i>“You cannot say somebody has HIV at a funeral, although you are sure that the person was HIV+. If you said that, then you and your whole family will be destroyed. Your children, your wife and everybody will be shunned.” (36 years old man)</i></p> <p><i>“I went to one of the public dental health centres, as I suffered continuously from pain in my teeth but the healthcare provider ignored me as I was the last patient in the queue to see the doctor.” (48 years old man)</i></p> <p><i>“Let us say people would know that I am HIV-positive. If we go to a funeral, they would not like to sit next to me or share anything with me. People would laugh at me if I spoke openly. People would joke about me for months. They would talk bad about me.” (25 years old woman)</i></p>
Social Relations	<p>Another participant stressed, <i>“I decided to tell my mother and sister about my infection. They were naturally upset and embarrassed with me, but they did not show it to me but I felt it. Please do not</i></p>

within community	<p><i>take my sickness as if I am in a coma or going to die soon.” (32 years old man)</i></p> <p><i>“Before the infection I worked in Saudi Arabia. After the infection, I lost my job and came back to Sudan, but when my family and neighbours came to know about my infection, they ignored me and did not take care of me. My situation worsened.” (39 years old man)</i></p> <p><i>“Even if people admit AIDS exists, they think they are personally immune. ‘It would not affect me, it is over there they will say’. We are always pointing our fingers.” (42 years old man)</i></p>
Gender Inequality Cultural factors Women dependency	<p>A 39 years old woman said, <i>“I was forced into marriage with my late husband’s brother, who had different sexual relationships, otherwise I would be forced to return to my maternal home, and take the responsibility for the children, with limited income and support. I got the virus from my late husband. Almost all the cash income from my husband’s domestic daily work was used to pay my medical bills relating to HIV/AIDS.”</i></p> <p>Women participated in the FGDs. Stated that, the main factor that led women to engage in high-risk sexual behaviours and expose them to HIV was gender inequality.</p> <p>A 40 years old woman stressed, <i>“Due to my infection I have been separated from my husband. I was forced to live in the city and worked as a housemaid, washing clothes to feed my children.”</i></p> <p>A 37 years old woman said, <i>“Gender inequality and poverty not only increased the risk of HIV but also leave women more vulnerable than men to its impact.”</i></p> <p><i>“After my husband divorced me, though he was the one who transferred the virus to me, my family kicked me out of the house, as I brought shame. I was forced to leave my small city and moved to another city with my two years old HIV+ daughter, where nobody knew of our infection. I worked by washing clothes daily in houses to earn money and feed my daughter, besides staying in a small shack, without access to water and electricity.” (31 years old woman).</i></p>
Constraints	
Nutrition constraints	<p>A 48 years old man said, <i>“Nutrition was very important for me to maintain my body fitness and to support my body so that when I took the drugs, I felt strong. However, it was difficult to obtain food regularly so my income decreased due to my sickness.”</i></p> <p><i>“Now we have free ARTs drugs in Sudan, so every month we go to the ART centre to have it, but if people do not have anything to eat, it will let them down and cause more problems. As a result we suffered from not having sufficient food due to the loss of our husbands.” (39 years old woman)</i></p> <p><i>“You know money is very important nowadays. If you are sick, you need money for treatment and food. Simply, everything needs money. Then, how is it possible for a person to give to a neighbour some sugar or flour that he or she had bought from the very little money.” (40 years old man)</i></p>
Psychological	<i>“Widows are spreading the virus. Their husbands have died and they have no help, so they work and</i>

Support Not Disclosed	<p><i>have sex with other people in order to get what they need. This is what people think about us.” (37 years old woman)</i></p> <p><i>“Disclosing to everybody is not easy. People would detest you and would classify you as a prostitute. Nobody would respect you if you were an AIDS patient. This was the reason why I kept my diagnosis a secret. However, only my mother and sister knew about me.” (29 years old woman)</i></p> <p><i>“When you are HIV-positive, you will lose your psychological, material and physical immunity. You cannot do your work as before, due to continuous infection of other diseases harming your body.” (29 years old man)</i></p>
Feeling when diagnosis HIV+ Denial Shock Think of killing myself Blame and Shame	<p><i>“At the moment, I know that I am HIV+. I immediately think of suicide. I feel like there is nothing in life. I feel depressed and shocked. Only my eldest brother knows about my diagnosis. He and the voluntary counselling centres help me to live with my infection.” (28 years old man)</i></p> <p><i>A 25-year-old woman said, “I feel sick (having fever and feeling weak). I went alone to see a doctor in a public hospital and the doctor asked me many questions about my history. He gave me a closed envelope and sent me to the lab for tests. I went to the lab and they said to wait for 30 minutes. When the doctor told me that I was HIV-positive, I was in denial and in shock. I thought of committing suicide. However, after being advised to join the PLHIV association, I felt better. I found many people like me at the association. I am married to a HIV+ man, and we have a pretty daughter as you can see. Till now the baby is HIV negative.”</i></p> <p><i>A 38 years old woman stressed, “I was feeling very stressed and thought of committing suicide but I had sympathised with my children and be strong. I am happy taking the medication (ART) as long as it helps me, and I get it free. I want to see my kids grow up. What example would I set for my daughter if I die and what will happen to my children?”</i></p> <p><i>Another participant said, “When my wife was diagnosed with HIV+, she cried most of the time but I comforted her saying that it is not her fault and that I do not like seeing her in that state. I was the one who was responsible to give her the virus, so I am the one to blame for that. I have to do whatever it takes to see to it that she is comfortable because I know if she is upset, she will be getting worse. So I have to help her to take her mind off it.” (43 years old man)</i></p> <p><i>“I feel very sick and tired of the symptoms and have continuous diarrhoea for three days. My family took me to the emergency section in the hospital. After 4 days, the doctor transferred me to the Omdurman Hospital and told my cousin about my disease. When he told me, I felt very sad and tried to take poison, but my mother calmed me down. Now I am alright and married to a HIV-positive man.” (25 years old woman)</i></p>

Source: FGDs results 2011

6.4.2.1 Human Capital Needs

Caring for AIDS patients differs significantly from caring for people suffering from other diseases. This is because of the complex nature of the disease. It manifests in various ways whereby health is affected, different symptoms developed due to deficiency in immunity towards the disease. The long duration of the sickness, hospitalisation, stigma and incurability of the infection are all part of its peculiar nature (Radstake, 2000; Simon & Abdool Karim, 2006; Levin et al., 2001).

Enquiring about the kinds of assistance and support that PLHIV needed, most of the respondents were quick to pinpoint financial support, medicines and food in that pecking order. Women had the tendency to express more needs than the men. Table 6.12 below shows the different needs addressed by the respondents.

Table 6.12: Human Capital Needs

Women's needs	Men's needs
Employment Acceptance from community Medicine Nutrition support School fees for children Healthcare for children Family support Negotiating sex and condom use Health insurance	Employment Medications Good Nutrition Capacity building (Income Generating Activities) Proper Treatment Health insurance

Source: FGD 2011 results

The areas for support listed in Table 6.12 suggested various needs based on gender. Childcare related issues, family support and negotiation of sex were areas in which only the women expressed a need for support. Raising sex negotiation and condom use is a priority for women and highlights the need for greater gender equality in Sudan. For men, they were concerned most with capacity building and proper treatment.

As can be seen from Table 6.13, infected persons received support and care from various sources. The majority of the respondents (93.3%) reported that advice was most often given by the healthcare workers from the Voluntary Counselling and Treatment Centre (VCT). The PLHIV associations are also identified as an important source for advice. The patient's mother most often provided treatment and care other than treatment at the hospital. Treatment and care could be given by the spouse or other family members as well. Eleven patients (36.7%) had to rely on food donated by WFP or similar institutions. Some patients received financial support from 'zakat', and only one patient received financial support from the government to pay school fees.

According to the reviewed literature (Batteh et al. 2008; Alemu et al., 2005), the results show that the impact of HIV/AIDS aggravates poverty. According to the results obtained from the respondents, there was a mixed perception among PLHIV about HIV/AIDS and its impacts. The majority of the participants responded by stating that the community considered HIV/AIDS as a 'curse' from God, due to the evil actions of human beings or a disease common only among the poor.

Table 6.13

Major Source of Care and Support for PLHIV

Source	Frequency	Percentage (%)
• Economic support		
Nothing	11	36.7%
Nutrition (WFP)	11	36.7%
Reduction in school fees	1	3.3%
Zakat	7	23.3%
• Social support		
VCT	28	93.3%
PLHIV Associations	2	6.7%

Source: FGD 2011 results using SPSS

6.4.2.1.1 Loss of Employment

The impact of HIV/AIDS on the household's labour force is both direct and indirect. Not only do most of the patients lose their jobs due to sickness or stigma, but also productive time to work is shifted to taking care of the sick. The PLHIV suffer from productivity losses because of morbidity (Simtowe & Kinkingninhoun, 2011). Approximately 20 percent of the participants stated that one of the crucial and important impacts of HIV/AIDS was job loss due to sickness. Sickness of household members decreases the number of members who are capable to invest full-time in useful activities.

The results from the PLHIV survey highlighted the effect of the epidemic on the current and future supply of labour and the likely consequences of household earning capacities in line with (Batte et al. 2008; Alemu et al., 2005; Arrehag et al., 2006). Some of the patients reported that they had been sick for more than six months and in some circumstances nearly a year, which resulted in their incapacity to work.

6.4.2.1.2 Coping with Nutrition

The need for sufficient and healthy nutrition was clearly highlighted within the discussion. Participants in the focus group discussions (see Table 6.13) described the role of finance and how its scarcity undermined mutual support relations, and the importance of nutrition, which keeps the body healthy and protected against opportunistic infections. The participants expressed the importance of prioritising their nutritional needs when taking the ART drugs.

6.4.2.1.3 Coping with Healthcare Expenses

The majority of the participants in the FGDs illustrated that medical expenditure is the main challenge in coping with the disease. This, they said, imposed an extra burden on their livelihoods. The discussions with the focus groups were in concord with some studies that reported on the influence of the socio-economic status on health service (Bernheim et al., 2008; Myburgh et al., 2005; Kim et al., 2004). The respondents shared their experiences as indicated in Table 6.11.

6.4.2.1.4. Children's Education

Many families with infected member(s) are forced to stop their children from attending school. Such children are saddled with the burden of assisting in the home, or generating income because of insufficient finance in the family. Children may find themselves in the centre of this situation when they are stopped from going to school, to work or to help in caring for their sick parents. This situation severely compromises the right of the child to basic education. Some studies of African countries asserted that because of their parents' status occasioned by HIV/AIDS, the surviving children might be psychologically affected leading to non-attendance of school and causing disruptions in schooling (Evans & Miguel, 2007; Gertler, et al., 2004). Table 6.11 shows how people cope with their children's schooling. This is likely to affect the girls more than the boys as less value is placed on girls' education particularly in rural of Sudan. This is due to the traditional belief that girls were better off to be married and be dependent on their husbands for a living.

6.4.2.2 Financial, Natural and Physical Capital

The majority of the participants explained their financial status after contracting HIV/AIDS. The findings from the FGDs supported the results from the survey

suggesting that women are additionally burdened by the economic impact of the disease, mainly in terms of income. SHHS (2010) reported that 56.9 percent of the households manned by women are below the poverty line, compared to 48.1 percent headed by men. It further found that women were economically dependent on men (Massnjala, 2007). According to the findings from the survey and from the discussions with PLHIV, generally women in Sudan are more likely to be unemployed than men.

Thus, HIV/AIDS intensifies the existing problems among PLHIV by contributing to their vulnerability to poverty. Eleven of the participants mentioned financial needs as priority. As much as 36 percent of the participants in the survey reported that they sold their assets to cope with other HIV/AIDS impacts. This evidence was provided by the focus group discussions. The group revealed that the initial asset base prior to infection determines the possibility of getting proper medical care. Most of the participants (99%) reported that after the infection they borrowed from relatives, friends, neighbours and co-workers to pay for their needs (school fees, food, drugs), which made them debt-ridden. Approximately 20 percent of the participants were forced to ask for assistance from their relatives and friends due to financial paucity.

The findings from the focus group discussion disclosed that the sale of assets to meet medical costs left the households with food inadequacy, and fewer resources to support their livelihood. This was unlike some affected persons (focus group discussion 1), where the participants mentioned that they were able to cover their medical expenses as their relatives assisted when needed. In line with these findings, the results from the PLHIV survey show that, 92 (96%) participants said that they had no savings (money in bank, assets, gold, land and houses) for the future. The affected persons earning a low income with no significant source of support were disadvantaged as their combined economic and social support needs were large. They frequently relied on

family members. This type of support often comes with constraints where family resources are limited. It was pointed out during the discussions that the manner in which the participants accepted their HIV tests results determines their inability to cope with the impact of the disease.

6.4.2.3 Social Capital

6.4.2.3.1 Coping with Stigma and Discrimination

Several studies concluded that stigma was a huge and powerful challenge affecting the social network and changing the ways in which people introduced themselves (Lekganyane, 2012; Holzemer et al., 2007; Petros, et al., 2006; Visser et al., 2009). The PLHIV in the discussion groups reported that they are often believed to have deserved what happened to them because the infection was acquired by “evil deeds.” These “wrong-doings” were linked to sex, predominantly extra-marital and pre-marital sex. However, less stigmatised men who become infected may be seen as having had sex with female sex workers. Female HIV carriers are seen as having been “promiscuous,” or being prostitutes. The communities shape these views with fear, ignorance while most of the time blaming those who have been infected. These underlying biases and stereotypes are reinforced when the stigma builds up on those with HIV/AIDS.

According to the finding from the FGDs, stigmatisation due to HIV/AIDS is a problem for both the infected men and women. However, women are more likely to be stigmatised due to socio-cultural factors. This situation stems from women’s inferior position in the patriarchal society as they have little choice in dealing with and negotiating their own sexual lives. A total of 29 respondents from the focus group participants (97%) described the stigma of HIV as a role that had harmful impacts on self-management of the disease. Stigma prevents both men and women from talking

about their HIV status, searching for social support, performing their tasks and participating actively in the community (Swendeman et al., 2006).

The interviewees described their experiences of stigma and rejection from the community. Once a person with HIV-positive status is known, there is usually some support from the immediate family such as their mothers and/or husbands. However, fear was often the main factor of their reluctance to reveal to other family members, employers and sexual partners.

An alarming and damaging situation was revealed during the discussions. Most of the participants were not courageous to disclose their HIV status to friends, or family members. The society perceived HIV/AIDS in the same way leprosy was perceived in the olden days. The stigma was so immense that if the infection is revealed to a third party the victim's family could be attacked. This case can be likened to what Talja (2005) describes as anticipated or perceived stigma, namely the fear of how others would react.

In addition, the participants in the FGDs reveals that being HIV-positive carries a strong sense of shame, and disgrace. Men are unable to work because of either their health conditions or the employers' bias against them (Stutterheim et al., 2012). The illnesses, sufferings and stigma occurring in these households motivated by the need for care or financial assistance, results in members moving to the cities, thus changing the composition and dependency ratio of the households. Former partners or relatives outside these households give little or no financial and material support.

Whereas perceived and enacted stigmatising attitudes towards individuals infected by HIV and AIDS are common and remains a major community challenge, the discussion with PLHIV in the FGDs indicate that pre-existing pressures and struggles with relatives and neighbours prejudiced the form that such behaviour took. Discrimination and harassment coupled with chronic poverty can have a significant

impact on the emotional and physical well-beings of children (Stutterheim et al., 2012). Their additional responsibilities as caregivers result in worry and concern of the life-threatening nature of their parents' illness. The children's schooling is often disrupted due to caring responsibilities and insufficient money for school fees because of the inability of their parents to work. These factors indicate that some young people are unable to continue their education.

Some of the female respondents declared that the workload of women, who either infected or living in a household with HIV/AIDS carriers, were significantly different from the workload of women living in households that are not afflicted. Clearly, the difference in workload was due to the amount of time the women spent nursing the afflicted. Immediate and long-term survival needs forced women to develop a range of coping strategies with varying implications on their health and well-being.

Many participants in the FGDs felt increasingly isolated and stigmatised by relatives and neighbours over time. When describing how their neighbours and service providers treat them, participants used stigmatising labels such as 'diseased', 'poor' and 'sin'. Several participants felt strongly that their impoverished circumstances deterred people from visiting or helping them out and that poverty exacerbated the stigma around HIV and AIDS (see table 6.11).

The results from the FGDs show that one of the greatest impacts of HIV/AIDS is the increase in widowhood and female-headed households. Children living in these situations tend to suffer greatly, since women in Sudan are not acquiring good employment to meet their children's required needs, including food and nutrition, security, clothes, school fees and healthcare (UNICEF, 2007). Feeling bewitched added to the sense of helplessness and victimisation.

The patients added that people who know their status refused to accept food from them and reduced contact with extended family members. Another source of

stigma existed among the healthcare providers towards PLHIV disclosing their infections in public health facilities were sometimes faced with challenges. Most times, they were forced to disclose their infection to receive treatment.

The findings suggested that at the community level, people were torn in their commitments towards the rights of PLHIV to confide about their status and social security. A frequently encountered viewpoint was that PLHIV presented a risk to public health by not disclosing their status. The underlying assumption being that it is the responsibility of PLHIV to halt HIV transmission, rather than the responsibility of each individual to safeguard his/her own protection from HIV. As a result, many seemed unable to appreciate the value of confidentiality, despite the willingness to provide care and support to infected people.

The most pronounced scaring feature of PLHIV in Sudan is its invisibility. Disclosure of status is clearly not the norm. Even within the HIV support groups, there are members who have not disclosed their status to partners or family. The PLHIV in the FGDs claimed “no knowledge of anyone with HIV” and infected persons interviewed reported that most of the individuals who tested positive refused involvement of partners or family, because HIV was shaped by stigma.

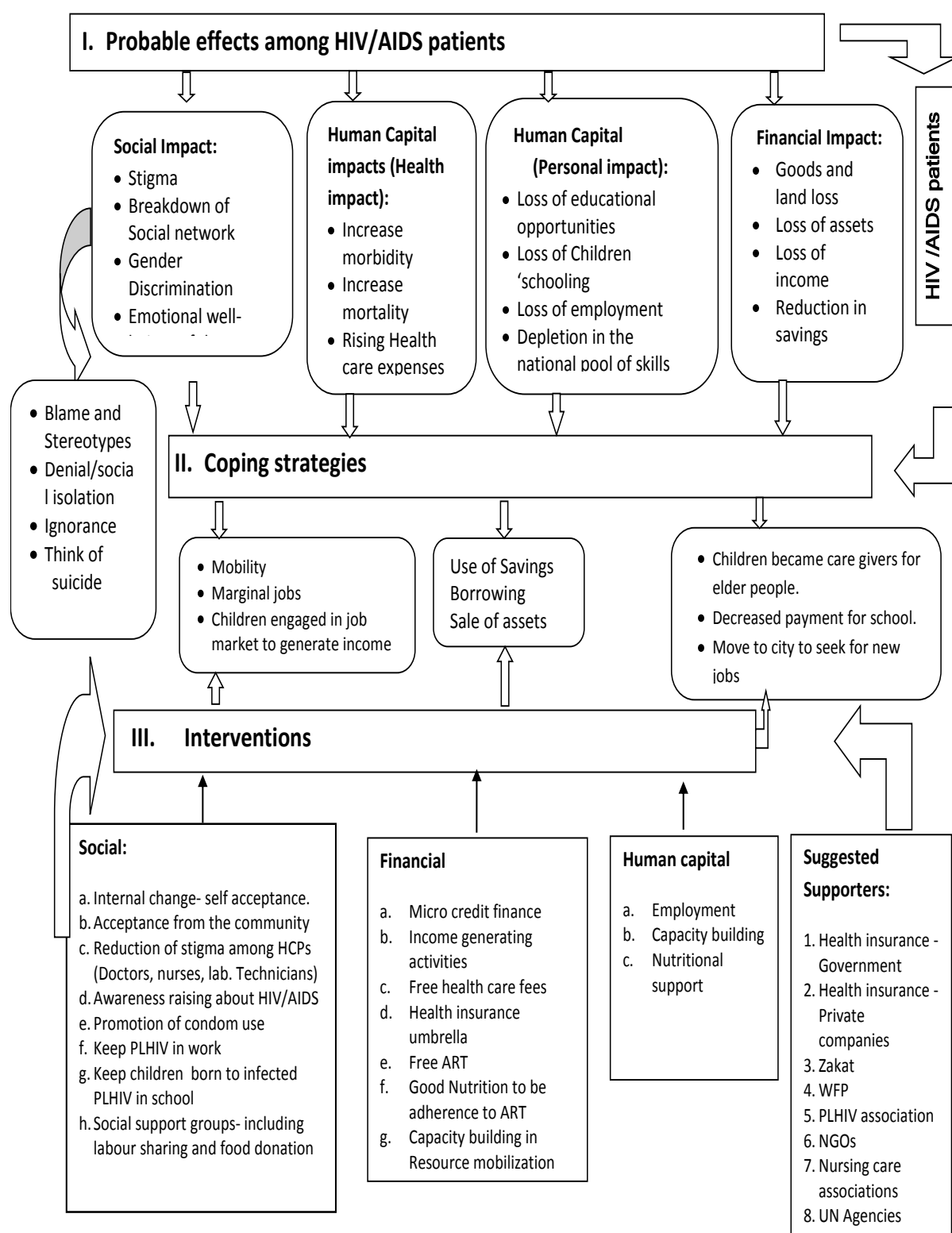
6.4.2.3.2 Feeling when Diagnosed HIV-positive

Many informants showed that they felt very stressed and lonely, particularly shortly after having been told about their HIV-positive status. Change, especially in traditional societies is usually slow and requires great sensitivity. Meanwhile, establishing open and trusting relationships in such instances and ensuring confidentiality will go far in giving people permission to begin talking about the issue. This is also a right step to being tested without fear of reprisal, reprimand, or labelling.

When a 24 years old woman was diagnosed as HIV-positive, she stated that she had the courage to face the disease with support from people around her. In addition, a 34 years old woman indicated high level of support from people she came in contact with in her daily life. However, two other participants, a 36 years old man and a 37 years old woman stressed that their cases were different with conclusion that... *“There was still some discrimination and rejection towards AIDS patients.”* However, all expressed satisfaction with the support they received from healthcare providers as they are more friendly and sympathetic.

Some of the AIDS patients felt that their families shared the burden and suffering owing to the nature of the disease, leading to increased poverty and affecting their children’s marriage prospects. Many patients blamed themselves for the negative consequences of the disease towards their families and with a feeling of guilt. Further, the patients felt upset and were under intense pressure because of the hardship of life due to HIV/AIDS.

Figure 6.3 Conceptual Framework of Socio-economic impact, Coping strategies among PLHIV in Sudan and Possible Interventions



6.5 Summary

The findings from this study shows wide range of coping strategies among PLHIV in Sudan. The findings in Table 6.2 indicates that more than half of the PLHIV have either acquired no education or have only obtained primary education. Moreover, the majority are engaged in marginal jobs such as daily workers and truck drivers aggravating their poverty and reducing their ability to survive the epidemic.

The findings in Figures 6.1 and 6.2 show that the main mode of HIV transmission was sexual intercourse (93%). Approximately 50 percent of the infected married women claimed to have contracted the virus from their husbands, and 56.8 percent of men noted that the most likely means of infection was through unprotected sex with sexual partners other than their wives. This indicates the risk of increased HIV prevalence within marriage.

The findings in Table 6.3 show maladaptive coping strategies among PLHIV. More than 80 percent (89.1%) of the infected persons had no savings for the future and about 74 percent rely on borrowings to tackle increased care expenditure. Approximately eighty percent of the PLHIV do not have source of income. Overall, the findings indicate that HIV epidemic deplete the already scarce resources of the infected persons and further push them into hardship due to mounting healthcare expenses. The Canadian AIDS Society (2004) in agreement of the views of Rodrtgo and Rajapaks (2010) explain the major coping strategies faced by PLHIV to include borrowings, sale of assets and utilisation of savings to cope with the out-of-pocket spending. The selling of assets was a very common coping mechanism adopted by PLHIV (Bonnell, 2000).

The results of the study from the FGDs show that the primary reason for selling the assets was to service their debts and to pay the children's school fees. However, the loss of any asset means that the wealth of a particular household is depleted making it difficult to cope with the impact of the epidemic in the long run.

The findings from Table 6.4 show the negative consequences of HIV/AIDS among PLHIV in terms of income and expenditure. Approximately 55.4 percent of those admitted to the hospital reported having their hospital bills paid by their relatives. This directly suggest much suffering and strong lack of coping mechanism amongst PLHIV.

The results in Table 6.7 show that the percentage of children of the infected person and affected households who remain in school after the infection has greatly declined from 58 percent to 45.4 percent over the period of survival with the impacts of the disease. This can be attributed to limited income needed to continue with schooling. Children in families affected by HIV are forced to drop out of school in order to assist in caring for the sick or to work and hence support the household. Consequently, the opportunities for children to get access to the right education is restricted. The findings in this chapter clearly address the research question 3 discussing how infected persons face great challenges in coping with the impact of HIV/AIDS thus, leading to a considerable negative effects on their standard of livings.

The prolonged nature of the illness takes a great toll on the members of the household, where income and assets become drained. On the same note, because the progression of HIV into AIDS reduces the level of productivity of those infected as well as those affected, with the latter taking time off to care for the sick. The level of man hours spent on labour work and therefore income generation significantly reduced, thus resulting in deep poverty conditions (Batteh et al., 2008; Alemu et al., 2005)

The findings from the discriminant function model in Table 6.8 show empirical statistical evidence that men and women experience the impact of HIV/AIDS differently. The findings clearly support hypothesis 4 and objective 5, on whether there is variation in coping strategies between women and men infected by HIV/AIDS and consistent with the literature reviewed (Batteh et al., 2008; Alemu et al., 2005; Arrehag et al., 2006). The variation relied heavily on multiple factors such as source of income

before and after infection, formal income, educational cost for children, marital status, level of education and cost of admission to the hospital. In addition, the finding from the model analysis show that both men and women did not behave differently when considering variables such as selling of assets, withdrawal of savings and borrowing to meet health expenditure as well as livelihood needs.

Evidence from this study indicates that the impacts of HIV/AIDS are more severe for women than men. Socio-economic factors and cultural values place men in a more favourable position when coping with the negative impacts of the disease. The evidence presented in this chapter especially that from the qualitative data as detailed in Table 6.11 describes HIV/AIDS-impacts on households, their livelihoods, and the variety of ways in which households deal with these impacts. The mortality and morbidity associated with AIDS have significant impacts on household resources and assets. Changes in the household composition and the individual's roles are among the notable effects brought about by the HIV/AIDS epidemic.

The findings derived from the FGDs gave strong evidence that HIV-infected persons are highly stigmatised in Sudan and that stigmatisation is still a wide spread occurrence (see table 6.11). However, a further predicament encountered by women in particular is that they are faced with higher levels of stigma due to the social and cultural perceptions of the community. This situation emanates from women's inferior position in the patriarchal Sudanese society. There is great fear from the community's negative reaction towards HIV, a fact that discourages from seeking out voluntary HIV counselling and testing, and in case of positive results, dissuades infected persons from disclosing their status. There is also a noticeable lack of support services for those infected with the disease. These findings provide critical information to healthcare providers on the dimensions of the stigma directed at HIV-infected persons in accordance with the literature reviewed (Masanjala, 2007; Mathur, 2013; Letamo,

2003). In addition, the findings support objective four by assessing the social coping strategies among PLHIV Information that can prove to be highly useful when taking into consideration the experiences of infected persons, as well as the challenges they face and ultimately lead to the planning of informed supportive interventions.

The finding shows that the majority of the PLHIV, either those included in the survey or the FGDs are from poor resource settings in accordance with the literature reviewed (Vasilakis, 2012; Okyere et al., 2010; Knodel & Im-em, 2004; Ha Noi, 2005). The greater bearing impact of the disease on the poor is aggravated when their limited resources are exhausted thereby pushing them into extreme poverty. Gender and age are important attributes that determines the impact of HIV/AIDS. The findings in Table 6.2 show that the majority of the respondents are within the age bracket of 16 – 45 years old, suggesting that the epidemic hits people at the peak of the productive age. Although the shock brought on by HIV/AIDS resembles that of other matters that may be faced in life, the shock resulting from acquiring HIV differs in a way due to the direct effect on the labour potential of adults in their prime years and in a way in which the impacts are gendered.

It is worth noting, however, that policy actors in Sudan have made efforts to provide universal access to free antiretroviral drugs. This study seeks extended efforts targeting strategies for HIV prevention and care and in the planning of appropriate national and subnational responses to the epidemic, in order to mitigate the socio-economic effects of the disease. Global health policies rely heavily on tools of epidemiology and health economics that are too rudimentary to understand a complex epidemic (Stillwaggon, 2006).

CHAPTER 7

Conclusion and Policy Implications

7.1 Introduction:

This study investigated the multidimensional relationship between poverty and HIV/AIDS in Sudan. The study has been examined the complex relationship between poverty and HIV/AIDS by investigating the socio-economic determinants of the epidemic and its impact. Despite attempts to combat the rising prevalence of HIV in Sudan, the underlying core problem of poverty persists, thereby undermining efforts at reducing HIV infection. The present study also examined the coping strategies among people living with HIV and concludes that this disease ultimately impinges on the livelihood of those infected.

This chapter is divided into five main sections. Section 7.1 provides a brief introduction and organisation of the chapter. Section 7.2 provides a precise conclusion of the overall study. Section 7.3 offers recommendations and highlights policy implications. Section 7.4 illustrates the contribution of the study and section 7.5 highlights the limitations of this study whilst offering suggestions for future research.

7.2 Key Findings:

This thesis started with the premise that there is complex relationship between poverty and HIV/AIDS. The overall purpose of this thesis was to investigate the vicious circle between poverty and HIV/AIDS in Sudan, in an attempt to establish greater understanding of the factors that made people in Sudan vulnerable to HIV risks. Motivated by the desire to identify the drivers (in the form of socio-economic factors) behind such sexual behaviour risks, the study also examined the impact of HIV/AIDS

and the coping strategies among PLHIV. In this manner, the study sought to fill the gap in research on the relationship between poverty and HIV/AIDS in Sudan.

The theory of sustainable livelihood strategy, drive theory, and structuration theory were used as basis for the inquiry into different variables that explain the link. The study used mixed methods approach with quantitative data drawn from people living with HIV in Sudan. In order to gain greater understanding of the relationship between poverty and HIV, the study deployed national survey data from the Sudan national household health survey 2010. Although the study was essentially quantitative in nature, qualitative data were drawn from focus group discussions among PLHIV to supplement and support the quantitative data and assist in interpretation and clarification of the findings.

The findings from this study support the existence of a vicious circle of poverty and HIV/AIDS in Sudan. Thus, the results achieved the objectives of this research, which help us to conclude that poverty with its related factors (low economic status, low level of education and gender inequality) increases people's vulnerabilities to HIV-risk .

One key outcome of this study is that the study provides significant empirical evidence of the importance of education in reducing the spread of HIV by avoiding HIV risk through using condoms, adherence to one non-infected partner, avoiding sexual contact with irregular partners and high-risk populations. In addition, the statistical analysis of socio-economic variables support that risky sexual behaviours as a function of low socio-economic status, which endorses the alternative explanations provided by the livelihood, structuration and drive theories, that explain how low-economic status deprive people and increase their vulnerability to risk.

Furthermore, this study supports that the livelihoods of poverty deprived women is aggravated by a lack of empowerment, which in turn exposes them to HIV

infections. In addition, some men behave in such a manner to cause violence against women. The results specifically show how Sudanese women's vulnerability to HIV could be seen in a dependent context. In addition, women have limited educational and employment opportunities compared to men and as a result face unequal access to resources such as employment and income. Hence, policymakers in Sudan need to formulate strategies to increase women's access to micro-credit schemes, which should be designed in a manner that will ultimately increase women's financial independence as well as ensure financial support for those who are unable to work.

The empirical evidence shows that HIV/AIDS epidemic affects different households in various ways, which then induces a variety of coping strategies from those affected. HIV/AIDS also reduces income, savings, and assets of the afflicted. Those faced with chronic poverty from childhood may impair their future prospects in life. Such experiences drag many of them into a vicious circle of poverty that entrenches them further in poverty, as these circumstances prevent them from dodging the poverty trap and its vices. In addition, the stigma and discrimination that comes with it presents a massive negative effect thereby constraining efforts and campaigns targeted at prevention and care of the infected people.

It can be summed up to say that, the robust quantitative and qualitative findings of this thesis are in sync with the literature that shows how low socioeconomic status exposes the poor to HIV. Hence, healthcare implementers in Sudan should not just focusing on the disease alone but consider strategies as to how to break the vicious circle of poverty. In addition, healthcare implementers should examine the novel framework used in this thesis as a cogent link between the causes, possible interventions, and effects of the disease.

This study offers further evidence to confirm what has been documented in the literature, that poverty increases vulnerabilities to HIV/AIDS and exacerbates people's

socioeconomic burden. In doing so, it also fills the gap in the literature on the relationship between poverty and HIV/AIDS in Sudan, and the particular way it affects the vulnerable groups. This in terms of food insufficiency and exposure to HIV, and addressed condom use in Sudan, which face constraints at national and local levels.

In conclusion, this thesis shows that poverty requires considerable attention in the context of bi-casual relationships between poverty reduction and HIV prevention programmes. The government of Sudan in collaboration with international, regional and local partners are mobilising resources, enhancing and building capacity to support the country to overcome the challenges that face its people living with HIV/AIDS.

However, there are no quick solutions to poverty and HIV/AIDS particularly among households and communities in Western and Eastern Regions of Sudan where civil war and insecurity continue to create havoc undermining any progressive efforts. The civil war has raised the complexity of tackling this problem considering lack of information on the relationship between poverty and HIV in Sudan. Thus, policymakers in Sudan will certainly benefit from the findings of the study to add value to their current policies and programmes in addressing poverty and the prevalence of HIV as well.

The findings offer compelling evidence for the formulation of comprehensive approaches to HIV prevention that cut across all socio-economic strata of the community. In addition, there is need to target the drivers of transmission in definite groups, particularly most at risk populations. Thus, the fundamental message to healthcare policy-makers is to extend efforts to reinforce prevention and treatment interventions without overlooking the vulnerability and its associated socio-economic factors.

7.3 Recommendations and Policy Implications

Despite abundant efforts to inform people in Sudan on the prevention and management of sexually transmitted diseases, HIV remains prevalent throughout the country. This has become a major concern for the government of Sudan, different stakeholders, and international agencies devoted to HIV/AIDS prevention. The strategies in responding to HIV/AIDS prevention and poverty reduction are as vast as they are interconnected. It is, therefore, necessary for health and development workers to adopt holistic policies and programmes to reduce poverty and address HIV/AIDS. Global health policies should combine the tools of epidemiology and health economics to enhance the understanding of this complex epidemic (Stillwaggon, 2006).

Blacker (2004) reported that efforts to understand the implications of the HIV/AIDS epidemic are very important for economic analysis and policy decision making. Policy actions and interventions that investigate the impact of HIV or the costs and burden to society must also address the problems of poverty. In turn, policy interventions that aim to alleviate poverty or vulnerability must address the HIV/AIDS problem.

The recommendations presented in this chapter are based on the findings of the study in chapters 4, 5 and 6. They are also based on the literature that was captured in chapter 2. The research findings have elucidated the complex interactions between HIV/AIDS, social capital, employment, gender and livelihood and have provided insights on the processes and dynamics involved. Thus, the following recommendations and policy implications could be adopted to contribute toward achieving the strategies aimed at reducing HIV prevalence and alleviate poverty in Sudan.

7.3.1 Poverty Alleviation

Poverty reduction strategies are very important measures that need to be taken seriously and given priority. Undoubtedly, these strategies are effective methods for controlling the prevalence of HIV/AIDS, mainly in an impoverished environment (David et al., 2007). Social security, investments in food security, youth employment, education and gender equality are essential ingredients in poverty alleviation programmes. Furthermore, successful poverty alleviation policies should address the impact of AIDS. This is so considering the obvious fact that one of the main consequences of the disease is the impoverishment of individuals, households and communities (Liu, 2003). Alleviating poverty in Sudan can go a long way in preventing and reducing further infections.

7.3.1.1 Fulfilling the socio-psychological Drivers

According to the reviewed literature (Luke, 2005; Collins & Rau, 2000; Booysen & Bachmann, 2002; Wojcicki, 2005) and drive theory, human beings have socio-psychological drivers that need to be fulfilled so that people can avoid stresses in life which may assist in decreasing their vulnerability to the HIV epidemic. In this regard, the findings show that poverty associated with low economic status, lack of education and employment were the main factors leading individuals to engage in unsafe sex thereby exposing themselves to HIV risks. The findings show that lack of education due to poverty was a significant contributor to HIV. The majority of Sudanese lacked knowledge of HIV/AIDS, mode of transmission, and condom use as an important preventative method (Khamis, 2013). Knowledge of HIV prevention methods is a critical first step towards addressing some of these key drivers (Scott, 2010).

The long-standing conflicts in Sudan, mainly in Darfur, South Kordofan, and Blue Nile have resulted in social breakdown, gender inequality, and poverty in many parts of the country, which in turn have led to crime, further violence, and the stressful conditions that accompany it. Structuration theory provides insights on behaviours that reflect changing places (displacement, become refugees or IDPs.), which result in psychosocial distress due to conflicts that further increases poverty in Sudan. This leads to loss of the right to live, security, stress and vulnerability to disease, and provision and access to health services (Adler, & Newman, 2002).

Within such situations, education is severely affected with children no longer remaining in school or may be required to help with the provision of food or conscripted to the military forces (Janjaweed). This is currently widely practiced in Western Sudan. These conditions can be improved by working to establish policies that positively influence social and economic conditions and those that result in safe sexual behaviours (Umberson & Montez, 2010).

7.3.1.2: Gender Equality

The findings show that women are less educated and employed than men. Investment in women's education may allow them to escape from the poverty trap. Some of the women may not be aware of their own inheritance and property rights (Herndon & Randell, 2013). Thus, this study recommends women's right to minimum education, thus enabling them to negotiate sex and access to information with regard to HIV prevention methods in order to protect themselves from the possibility of infection (Walker, 2004). Moreover, it is important to promote the use of condoms in Sudan as a prevention method and to consider it a top priority in health planning (Oni, 2005; Glynn et al., 2004).

The results from this study show that most Sudanese women are vulnerable to HIV due to poverty associated with lack of economic, political and cultural powers in the society. In this regard, the concept of empowerment is considered a key factor in reducing women's vulnerability to HIV (Walker, 2004).

Sudanese women are found to be more unemployed than men. The major policy implications and recommendations from the analysis are that decision-makers in Sudan need to reduce the gender gap in the labour market. This could be done through facilitating women's access to ownership of lands and loans with different uses. Elimination of inequality in job practices in Sudan that prohibit women from accessing some types of jobs such as working in restaurants, general transportation areas, petroleum stations, in addition to economic and social support aimed at enabling mothers to improve their income sustainability by providing baby care services at their workplace at attainable costs (Basta, 2007).

To date, economic programmes in Sudan have only focused on measuring the classic financial indicators such as poverty targets or financial sustainability measures (SHHS, 2006). Dimensions such as women's empowerment and other HIV-related outcomes that rely on it should be systematically evaluated and considered over a longer timeframe to monitor changes. Microfinance can have a significant impact on cross cutting issues such as women's empowerment, decreasing the prevalence of HIV/AIDS, as well as improving social indicators such as education and health.

Support strategies such as micro-credit schemes should be designed to increase women's financial independence and to support the careers of those unable to work (Stevenson & St-Onge, 2005; Wojcicki, 2005). The control of one's own money may influence HIV protective behaviour among Dominican women who were receiving loans through micro-credit programs and may be significantly associated with HIV related negotiations (Ashburn et al., 2008). This may indicate a positive impact of

women's participation in credit programmes on their demand for formal healthcare. In addition, it can be used as a mechanism for women's economic empowerment.

The findings show that women are more shouldered by the AIDS impact than men. There is an urgent and obvious need to address the policies and legislations set in place to reduce poverty and the prevalence of HIV among Sudanese women. This could be achieved by seeking collaboration from the men and input towards achieving gender inequality. An example of this can be seen in Rwanda where Rwandan women are considered as world leaders in gender equality and taking leadership in promoting laws that protect them against violence and abuse, in addition to having achieved a 56 percent majority in parliament (Herndon & Randell, 2013).

The majority of the infected married women in the PLHIV survey claimed that their husbands infected them. Thus, this study suggests scaling up HIV testing and promoting mandatory HIV tests before marriage as practiced in Congo, Nigeria and Rwanda to reduce the prevalence of HIV transmission (Reniers & Helleringer, 2011).

7.3.1.3 Improvement in Employment and Education:

The inability to afford sustainable livelihoods in rural areas is the main driver behind labour mobility to urban areas, which has the potential of increase exposure to HIV (Dibua, 2010). Efforts to create industrial or commercial enterprises thereby shift the population from the old subsistence agricultural practices to modern industrial production (Hazell & Wood, 2008), and may help to reduce the shortage of the active and productive labour force and will be fully occupied in production and may assist in avoiding engaged in unsafe sexual practices.

This study suggests creating more employment opportunities in rural areas to improve income generation for the poor. Attractive projects in agriculture should be established in rural areas to benefit unemployed youths. Further, small and medium

enterprises (SMEs) should be created mainly for women and the population effectively shift from primitive agricultural practices to modern methods of production (Stevenson & St-Onge, 2005).

There is a need to state the obvious fact that political stability is essential. War ruins the infrastructure and derail development efforts in Sudan, thus increases human capital mobility. Peace and political stability is enhanced by strong democratic, committed and progressive policies. Therefore, political actors must be committed to peaceful existence of the state as part of the extended efforts in fighting HIV/AIDS and alleviate poverty.

The various HIV prevention programs must seriously implement measures to decrease the prevalence of HIV successfully through poverty reduction, adequate sensitization campaigns and promotion of education especially among girls. In conformity with the result of this study, evidence from countries with high HIV prevalence show that new HIV had greater effect among the poor and low educated (UNDP, 2002; Mbirimtengerenji, 2007).

7.3.2 Reduction of HIV Prevalence

The findings show that respondents in the household survey lacked knowledge about HIV prevention methods. Intensive awareness campaigns are required to inform people about the reality of HIV/AIDS risks. With the huge risks involved, communities should be educated through preventive programmes showing the socio-cultural and economic practices that expose members of the community to HIV risks. It is not just about information on HIV prevention and counselling lessons reaching the vulnerable persons, but that such messages must be suitable and relevant to reflect the reality of the infection on their lives and cultures (Rugalema et al., 1999). However, even if the information reaches the poor, it is rarely the case that they will adopt the recommended

behavioural change (Mbirimtengerenji, 2007). This is due to a low level of education among the poor.

The finding shows that some Sudanese men from poor resource settings engaged in sexual behaviours that may expose them to HIV risk, such as being unfaithful, lack of use of condom (91.5%), unsafe sexual practices with irregular partners (77.5%), and FSWs (57.7%). The main challenge is to find sufficient and sustainable methods of changing sexual behaviours. Behaviour change requires an understanding of the economic, social, cultural, religious and political factors that make people engage in such behaviours (Hargreaves J.R., 2007). It is important for the authorities in Sudan to prioritise the interest of the people particularly those from poor resource settings in their efforts to develop the economy.

This study encourages the decision-makers at the Ministry of Health in Sudan, which houses the National AIDS Control Programme to raise awareness of the current potential socio-economic impact of HIV/AIDS together with the development agenda. They should work with civil societies and other governmental and non-governmental organisations to reduce the impact of HIV/AIDS. Many people in Sudan believe that AIDS infects only those who are doing something negative or sinful. Civil societies and government agencies should address these misconceptions to enhance behavioural change and sustainable awareness campaigns. Thus, the study suggests the following recommendations in the light of the findings to reduce the prevalence of HIV/AIDS in terms of mitigating its impacts and survival.

7.3.2.1 Mitigation of Socio-Economic Aspects of the HIV/AIDS Epidemic

The present study describes the loss of resources in coping with HIV. The findings show a wide range of coping strategies among PLHIV. In an attempt to

improve the lives of those infected and in view of the findings of this study, the following recommendations are proposed.

This study encourages all the relevant stakeholders to focus on this destructive pandemic and consider it as not only a health issue but also a development problem (Hughes et al., 2004). The findings from the PLHIV survey and the FGDs show that children born to infected person lose their educational opportunities. To mitigate the impact of the epidemic in the short and long term, this study suggests that both food security and school attendance of children from affected households should be guaranteed as a matter of urgent national interest. The study supports the suggestion raised by Kakuru (2006) who proposed the provision of free meals to keep children in school, instead of wasting their time to feed for themselves and fulfilling their basic needs.

Treatment allows infected persons to stay healthy and can help people to work (Tsai, et al., 2011; Suttajit, 2007; Hughes et al., 2004). Thus, health planners and healthcare providers should take extra effort to make people living with HIV better adhere to ARTs to become healthier and have the ability to work.

The FGDs among PLHIV show that personal financial burden makes it difficult for those on treatment to strictly adhere to prescribed healthcare. The main reasons are unaffordable transportation costs to and from the clinic and the lack of good nutritious food. Concerted efforts to increase international aids and ensuring the availability of ART centres in outreach areas are very important and should be supported through resource mobilisation. Half the Kenyan population lives on less than US\$ 1 a day and about 40 percent of PLHIV who started on ART no longer adhere to healthcare due to the same above mentioned reasons (UNAIDS, 2011).

The findings from the PLHIV survey and the FGDs show that infected persons in Sudan lose their work due to HIV. Thus, this study suggests the need for policies

aimed at keeping PLHIV in the workplace. It will be encouraging to ensure that employers accept and retain employees with HIV/AIDS and not to stigmatise their status.

Sustainable livelihood theory states that people rely on their assets to face risk and uncertainty. PLHIV were more likely to become poorer and lose their assets due to the burden of the disease. This study suggests strengthening the NGOs/CBO partnership and umbrella to lead economic development intervention for PLHIV. This could help encourage PLHIV to get involved in entrepreneurial projects such as income generating activities that assist them to generate income for their personal and household needs. Loans for these projects should be made available for those who are currently involved in economic activities (Hajdu, 2011).

One way in which this can be done is to provide revolving loans coupled with help to raise start-up capital. This has the potential to improve poor PLHIV's chances of securing sustainable livelihoods in the futures (Hajdu, 2011). PLHIV are able to initially use these loans to undertake small income generating projects such as producing and selling traditional foods, and selling of vegetables or fruits.

Due to the growing number of people in Sudan requiring care for AIDS, there is a need for the health sector to introduce reforms, which should be seen in the context of a broader public service reform. The findings suggest that wider access to affordable medical care services at reduced costs and enhanced social security system offering support to PLHIV under the health insurance umbrella may be important in mitigating the impact of the epidemic.

The findings from the FGDs show that PLHIV are dependent on public hospitals, probably due to a lack of income to pay for healthcare expenses at private hospitals. The government of Sudan would not be able to reduce the healthcare expenses especially with the rising healthcare cost (drugs and medical technology) and

increasing number of people, with rising chronic diseases and communicable diseases persisted. The government should be asked to increase proportions of GDP for healthcare since most people are poor, especially those living with HIV. In addition, health planners must extend efforts to eliminate stigma among healthcare providers to enhance quality health services, and to make sure that healthcare services are available at outreach areas and enhance its capacities.

There is a need for the political leadership to play a lead role in coordinating public and private sector involvement in HIV responses. The Ministry of Justice may possibly be the main office leading the efforts and human rights of PLHIV rather than the Ministry of Health. There is also a need to sensitise and advocate the authorities of the Ministry of Education to raise awareness of HIV modes of transmission and prevention. The Ministry of Education should also be at the forefront in ensuring that discrimination against those affected is controlled in schools. The most important recommendation to meet the educational needs for PLHIV is to minimise the number of school dropouts for their children (Arrehage et al., 2005).

Another way forward is to undertake more in-depth micro studies of sexual cultures among the general population in Sudan. The situation has gone far beyond concentrating on sex workers. Such studies should include communication patterns in marriage and sexual rules, as these issues are very important and need to be examined. There is also a need to sensitise the communities through radio and film shows on the socio-cultural and economic practices that expose people to the disease. This focuses on the social, political and economic context in which the epidemic occurs and seeks the attention of the key figures in areas of development in Sudan to contain the spread of HIV/AIDS.

7.3.2.2: Reduction of HIV/AIDS Survival

In spite of the difficult situations and numerous problems, it is important to note some positive developments in the area of HIV preventions and support. Firstly, Sudan's National Strategy, 2010, encourages and advocates the importance of including PLHIV and their associations in the fight against HIV/AIDS. For this reason, PLHIV are now represented in all the major bodies, such as the National AIDS Council (NAC) and the Technical Working Group. These bodies provide relevant information on how to combat the disease. They are also involved in training activities aimed at reducing stigma and ensuring that PLHIV can better cope with the disease.

The government of Sudan has played a lead role in the fight against poverty and HIV/AIDS. It has effectively mobilised resources through collaborating with the international community and local NGOs in the crusade. The President of the Republic of Sudan, the chairperson of the National AIDS Council (NAC) in fighting against HIV has approved over six national strategic plans, which were formulated as part of the implementation of the HIVAIDS control program in the country. Through partnership with international and local NGOs, the government has provided ARV drugs and home-based care for PLHIV. The political will in the fight against HIV is overwhelming in supporting voluntary testing and counselling, sensitisation campaigns and providing accessible healthcare centres across the country.

PLHIV should be actively involved in planning their future on their own terms and applying their tailor-made specific plans according to their own expertise, which integrates into the national plans. The leaders of the PLHIV associations in Sudan should be empowered in certain foreign languages such as English. This will avail them the opportunity to effectively interact with counterparts and donor agencies in other countries.

It should be noted that a well rehabilitated and trained HIV-positive person with social and economic support, having access to quality healthcare makes a difference not only in his/her personal life but for the society as a whole (Basavaraj, et al.2010). This could be achieved by removing stigma and considering HIV as other diseases that cannot be transmitted through daily contacts. By doing this, PLHIV can assess social security through formal employment. This can be achieved by talking openly about HIV in the community by involving religious and community leaders and increasing public awareness of HIV modes of transmissions and prevention methods through peer education.

The magnitude of the HIV epidemic tends to be hidden due to lack of disclosure of the HIV-positive status because of fear from stigma and discrimination (Masanjala, 2007; Mathur, 2013; Letamo, 2003). The majority of PLHIV declared that they are not willing to disclose their infection. There is an urgent need to break this silence. Disclosure of HIV status will assist in knowing the extent of the problem, thus motivating the broader community to ensure appropriate interventions to guide the large number of affected households. To enable collective actions, it is important to foster social-relations between the affected individuals and households and other community members to secure care and reduce stigmatisation.

The study concludes that approaches to HIV prevention should focus on the roots of transmission within different groups. Specific concerns are the vulnerabilities faced by the youth and women and of the dynamic nature of the relationship between socio-economic status and HIV.

7.4 Contribution of the Study

This study examined the dual-relationship between poverty and HIV/AIDS. The analysis confirmed the causal relationships. The quantitative and qualitative findings

discussed and linked to the research objectives. Thus, the present study adds six main contributions to research in the area of poverty and HIV.

Firstly, the findings provided additional insights to the limited work conducted in this area in Sudan as a country with low HIV prevalence, and addressed the bias of several studies conducted and concentrated in the Sub-Saharan African countries with high prevalence (Tladi, 2006; Mishara et al., 2007; Gillespie et al., 2007; Barnett et al., 2006; Wojcicki, 2005; Masanjala, 2007; Hargreaves et al., 2007; Weiser et al., 2007).

Secondly, the study provided qualitative and quantitative empirical analysis to fill the gap in information about poverty and HIV/AIDS in Sudan. It also addresses the failure to consider socio-economic information in planning healthcare, which causes a gap between policy-makers and programme implementation at the national and local levels. In addition, the study collected socio-economic information on the social and economic factors that influenced the Sudanese population and women's vulnerabilities to the risk of HIV. Further, by making this information available to top health planners, our findings may contribute to improving the design and quality of socio-economic information programmes as well as poverty reduction strategies. The results of this study are anticipated to be useful to researchers interested in AIDS and development studies as well as medical sociologists.

Thirdly, the study explores the difficulties in coping strategies among people living with HIV/AIDS. It provides a novel framework illustrating these coping strategies. The essence is to inform policy makers and other key stakeholders in Sudan about the extent of the impact of HIV/AIDS at the micro and macro levels. The long-term benefits of this cannot be overemphasised.

Fourthly, the findings of the survey categorise the respondents based on gender. The study examined the variations and similarities of socio-economic and demographic variables and behavioural biases between men and women. This is approached from the

angles of both the context of vulnerability to HIV and coping strategies among infected people in Sudan. This is to gain a better understanding of the relationship between poverty and HIV from the gender perspective.

Fifthly, the study used different data sets and attempted to link the analysis with the conceptual framework to draw a comprehensive conclusion on this complex study. Using three types of data sets allows an assured degree of triangulation of the findings and emphasizes their complementariness. Finally, and of great interest, was that the study offers a micro behavioural structural equation model which is hoped to be an encouraging tool to identify the socio-economic factors behind HIV-risk behaviours. It also hopes to deliver this key message to policy-makers in Sudan to extend their efforts to allow a balance between relying on prevention and treatment interventions without ignoring the vulnerability and its associated socio-economic factors.

7.5. Limitations of the Study and Suggestions for Further Research

The study was hampered by several shortcomings. Collection of longitudinal data would have been ideal. However, due to constraints in the funding available for the fieldwork, it was decided that cross-sectional data and the national survey data from the household survey be used to assist in filling the gap.

Another limitation was that respondents consciously, or subconsciously, offered responses that they think that the interviewer wants to hear or what they thought would impress the interviewer (Noy, 2009). This may cause bias in the research findings. Some of the questions required people to recall their memories of what had happened in the past months or in the past years. A typical instance of these questions concerns the economic status of PLHIV before and after the infection. It was somewhat difficult for people to give the exact information at the particular point in time from memory. To overcome this problem, wealth or assets was regarded as a valid indicator of economic

status. Data collection on income and house ownership measures wealth through personal possessions such as land ownership, bank account, and assets such radios, TVs and other consumer goods (Chuma & Molyneux, 2009; Seeley et al., 1994).

7.5.1 Suggestions for Future Research

This study suggests a comparative research by combining poverty and HIV programs between developed and developing countries. This will provide different reactions and facilities in fighting HIV and poverty between the two economies. A comparable study of the population unaffected by HIV should be included in future researches. This, it is hoped, will lead to a comprehensive understanding of behavioural influences on measuring the impact of the epidemic. There is also a need for detailing the place of the various religious in this vicious circle of HIV/AIDS and poverty.

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